PROVINCE OF BRITISH COLUMBIA

REPORT

OF THE

FOREST BRANCH

OF THE

DEPARTMENT OF LANDS

Hon. WILLIAM R. ROSS, K.C., Minister

FOR THE YEAR ENDING DECEMBER 31ST

1912

THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

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Western Red Cedar, Wet Belt, West Kootenay.

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The average stand of Yellow Pine, East Kootenay Valley, is open and scattered.

Young Yellow Pine on logged-over land, East Kootenay, where fire has been kept out

REPORT OF THE FOREST BRANCH.

January 7th, 1913.

The Hon. William R. Ross, K.C.,
Minister of Lands, Victoria, B.C.

SIR,—The Forest Branch, which was created in February, 1912, by the passage of the "Forest Act," is now organized and at work. I have the honour to submit herewith the First Annual Report of the Branch, in which is discussed in detail the work planned, in progress, or already accomplished, in the general fields of forest-protection, timber-sales, forest surveys, and organization.

Since the report is necessarily of some length, it has appeared advisable to condense its more important features under the following summary:—

THE FOREST WEALTH OF BRITISH COLUMBIA.

British Columbia contains one of the few great bodies of commercial timber left in the world which are not yet materially reduced by destructive lumbering. With the possible exception of Siberia, Brazil, and the North-western United States, the timber wealth of British Columbia is unparalleled in any other country.

The investigations of the Forest Branch have gone far enough to show that British Columbia contains not less than one hundred million acres of forest land, and that the total stand of commercial timber is certainly not less than three hundred billion feet, and probably much more. At present the lumber-output of British Columbia is about a billion and a quarter feet a year. At the present rate of cutting, making no allowance at all for annual growth, it would take the lumber industry of British Columbia nearly 250 years to use up merely the mature timber now standing. The annual growth of the forests of British Columbia is even now, before they are either adequately protected from fire or from waste, certainly not less than five times the present annual lumber cut.

These figures indicate clearly what, at least in part, should be the forest policy of British Columbia. Several times as much timber is now going to waste each year through natural decay as is being used in the same year. Merely to protect our forests from fire, but to lock them up against fuller use, would be only in slight degree less wasteful than not to protect them. Conservative methods of lumbering will not only utilize timber now going to waste, but will actually improve the condition of the forest. To provide adequate fire-protection for our forests is one prime need, but to get them adequately used is of equal importance.

The situation calls urgently for a forest policy which will encourage the development of a greater lumber industry for British Columbia along lines which will provide for the prompt utilization of mature timber and for safeguarding the forest against unnecessary waste, and which will ensure a good second crop upon logged-off lands.

In less favoured countries not blessed as we are blessed with great natural forest wealth, or which have exploited and destroyed their forest wealth recklessly and needlessly, the returns from forestry sometimes consist merely in the indirect benefits conferred by husbanding what is left, and so far as possible restoring forest cover to those areas which have been denuded. But in British Columbia the forests should, and will, prove not merely the source of general benefit through their protection from fire, but the direct source of great and increasing money returns to the Government, and consequently to the people.

Obviously, we must not go so fast in forest-utilization as to depress lumber-values by overstocking the lumber market. That would be most unwise, both as a matter of business and in its invitation to increased waste in logging and manufacture. A thoroughly reliable index to the extent of waste in the woods from lumbering is the profit gained from his operations by the lumberman. The higher the profit, the less should be the waste; the lower the profit, the larger the waste inevitably will be.

To sum up, then, British Columbia possesses forests whose actual production in wood each year is alone five times her total lumber cut. What is not cut is wasted in the end.

Thus the Forest Branch faces, as one of the most important duties before it, the establishment of an active and at the same time a well-guarded policy for the utilization of mature timber along lines which will encourage legitimate development, and provide for the utilization and improvement of the forests.

FOREST FIRES.

It is seldom a productive policy to swop horses in the middle of the stream. Consequently, the Forest Branch, whose organization took place about the time forest fires were beginning to burn, did not during the fire season of 1912 attempt radical changes in the organization of the patrol force, but simply made the best use practicable of a necessarily imperfect instrument. The result was, due partly to a favourable fire season, that the forest-fire damage in 1912 in British Columbia was, so far as it is known, the smallest in its history. That in itself is encouraging; but it is still far short of good enough.

The total damage by forest fires during the past season aggregated more than $300,000, and about 160,000 acres were burned over. In the light of the inadequate patrol force, the fact that this damage was not greater is exceedingly creditable to the Wardens. But in the light of the amount of public property unnecessarily destroyed, this damage is indefensible. The goal which the Forest Branch has set for itself, which is an entirely practicable goal to attain so long as the necessary provision is made for its work, is that there must be in British Columbia no material damage done by forest fires at all.

An active policy of timber-utilization, as already outlined and recommended herein, would be most unwise, unless our forests are adequately protected from fire. There is even less justification for letting public property burn up than there is for failing to use it wisely. Hand-in-hand with our policy of forest-utilization must go an equally active policy of forest-protection, and the money and the men needed to put that policy into effect.

The experience of the past season and of preceding seasons makes it clear that the following are the more important needs towards further reducing the yearly loss to British Columbia through forest fires:—

(1.) A field force picked with an eye single to the work in hand, adequately paid, and, so far as the need justifies, retained throughout the year, instead of merely for the summer months. It will be practicable, and it is highly advisable, to keep as permanent employees at least a skeleton organization. There is ample and urgent work for many men during the winter months in trail and telephone building where the weather permits, and in forest surveys. Merely temporary employment here, as elsewhere, can never get and hold many good men.

(2.) The second requisite for better fire-protection are roads and trails over which patrolmen may travel, and over which supplies may be brought in; and telephone-lines, in order to get men quickly to the fire-line when fires break out. Trails and telephone-lines are cheaper in the long run than men. For, in the aggregate, at a relatively small expense the efficiency of the present fire-fighting force can be increased at least twofold by the necessary telephone-lines and trails. The construction of these permanent improvements, useful not merely to the protective force, but to all classes of the local population, should be looked upon for several years to come as an urgent and essential part of our work in forest-fire protection, and adequate funds should be provided for carrying it on.

(3.) Serious fires broke out this year and gained great headway before the Wardens were put on. It is essential, in order to give efficient fire service, that the men should be on the ground before the fires begin. This period will vary in different parts of the Province and in different years, and consequently the need for a wide degree of elasticity is clearly indicated, rather than a fixed date for putting men into the field.

WORK DONE.

The Forest Branch is about six months old. It has a working scheme of organization and already an active current business. Neither its organization nor its personnel are as yet entirely complete, for such a task requires more than six months.

A good beginning has been made. The forest-fire record, as outlined above, while still far from good enough, is the best in the history of the Province. On the side of developing

Thus the creation of the Forest Branch has not resulted in increasing the drain upon the Provincial Treasury. While the cost of our forest-work must increase as the volume of that work increases, there is abundant indication that this cost will constitute a smaller and smaller percentage of the total receipts yielded by the Forest Branch.

Fundamental to the work of the Branch in developing a progressive and well-guarded timber-sale policy are the forest surveys recently begun. These consist of practical studies of the different forest regions in British Columbia to determine not merely their needs for efficient administration, but, above all, to acquire that necessary practical and exact knowledge of the character, value, and condition of their timber resources required as a basis for the development of their fullest usefulness. The results of these forest surveys will appear from time to time as bulletins of the Forest Branch, and will be of value not merely as guides to the general extent of our forest resources, but to lumbermen and other forest-users.

There are, of course, many other useful projects upon which work is already in progress by the Branch, or planned for the immediate future, as, for example, its studies to encourage the pulp industry, to invite a more complete utilization of low-grade material, and its investigations of scaling methods and of mill and logging waste. But, as outlined above, the three great tasks before the Branch to which its chief effort will be given, are more efficient fire-protection, the improvement of the forest by an active timber-sale policy along conservative lines, and the production of a steadily increasing revenue from forest resources.

CO-OPERATION.

The Forest Branch is young, and it faces a great opportunity. The material welfare of British Columbia is inseparably bound up with the success of her forest policy. In the last analysis, the success of the Forest Branch will depend in large part upon the knowledge, and consequently upon the understanding, which the people of British Columbia have of its work.

The Forest Branch is dealing administratively with a public resource—a resource which is the property of the whole people—and the Branch is, in a very real sense, the steward of the people and the servant of the people in the protection and use of the people's own property. Through its bulletins, through addresses, by personal intercourse, and above all, by a frank and direct method of procedure, the Forest Branch will do all in its power to inform the people of British Columbia about their own property which the Forest Branch administers in trust. It will also make a special effort to obtain in their own and in the common interest the co-operation of lumbermen and other forest-users in its work. In line with this endeavour, and on the initiative of the lumbermen themselves, is the appointment of forest-protection committees by both the British Columbia lumber associations, which will co-operate in an advisory capacity with the Forest Branch toward the development of a still more efficient forest-fire patrol. In the matter of co-operation again, a good beginning has been made.

FOREST PROTECTION.

The month of April, 1912, was generally much drier than usual, and was followed in the first half of May by a period of very dry, hot weather, accompanied by strong winds. During this period a number of fires broke out all over the Province. Those on the Coast and on Vancouver Island were confined wholly to slashings, and while a number of donkeys and other equipment and a few camps were destroyed, practically no damage to standing timber occurred. I regret to report, however, that one life was lost in one of these fires on Vancouver Island. Serious loss and damage to standing timber occurred, however, later on in the season in the following sections of the northern part of the Province—namely, in the Bella Coola Valley, along the Skeena River north and east of Hazelton. Reports received from different outside sources indicate that large areas of timber land were burned over in the Peace River Valley and adjoining portions of the Province about the middle of the summer. It has not yet been possible to employ Fire Rangers in this district, although the Dominion Government has set an example by employing Fire Rangers in the less-timbered adjoining region in Alberta.

In the Bulkley Valley, and between Quesnel and Fort George, a considerable amount

20,000 acres of merchantable timber killed. The latter is difficult to estimate, but is probably close to 100,000,000 feet. Most of it is located near the G.T.P. Railway, which will probably be operating by 1914, when a part of the fire-killed timber will doubtless be salvaged.

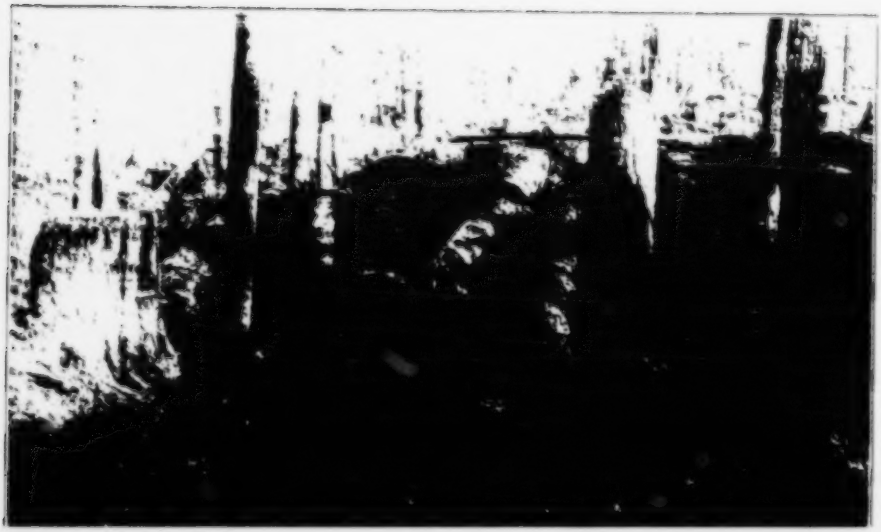
In the months of June, July, August, and September, which ordinarily constitute the driest and most dangerous fire season, rains were frequent and generous over the entire Province, except in the northern region, including the Skeena and Bulkley Valleys. In consequence there was no bad fires except in the two last-named valleys, and in these the timber destroyed was for the most part small and located on agricultural land. Altogether about 160,000 acres were burned over, and 200,000,000 feet of merchantable timber, or one-tenth of one per cent. of the total stand of the Province, was killed by fire during the past season. A large percentage of the area burned over and the timber killed was burned early in May before the Fire Wardens were put on duty.

Tables giving the total reported damage by fires and the number of fires classified according to their cause are given below:—

Unknown	149
Fires started before season	39
Campers	38
Railway-locomotives	34
Lightning	23
Donkey-engines	11
Railway-construction	11
Public-road construction	9
Uncontrolled permit fires	8
Smokers	7
Accidents	6
Logging-railways	6
Prospectors	3
Indians	3
Total	347

DAMAGE FROM FOREST FIRES.	Value.
Merchantable timber killed, 200,000,000 feet @ $1 per M	$200,000 00
Cut logs 64,000 feet @ $8	512 00
Shingles and rough lumber, 10,000 feet Railway-ties, 11,300 feet	39,300 00
Fencing, 1 mile	100 00
Telephone-line, 4 miles	1,600 00
Cordwood, 1,050 cords	2,100 00
Logging equipment	10,000 00
Houses and contents, 1	1,500 00
Dairy	100 00
Cabins, 5	500 00
Camps and contents, 5	6,095 00
Tents, 1	20 00
Blacksmith-shop	200 00
Bridges, 7	350 00
Sawmill, 1	10,000 00
Shingle-mill, 1	20,000 00
Live-stock, 100 pigs	600 00
Corduroy road, 450 feet	200 00
Railway contractor's camp and equipment	20,000 00
Hay, 8 tons	96 00
Total damage	$313,273 00
Cost of fighting fire, Forest Protection Fund	20,870 79

Logging operations in Kootenay Valley. Note small logs used.



In addition to the above, a large amount was spent by the railroad companies in maintaining a patrol along their tracks, and by private timber-owners in patrolling their holdings and building trails and telephone-lines for better fire-protection.

It is possible that much of the timber killed by fire, particularly that along the Grand Trunk Pacific, can be salvaged, and if the efforts which are being made in this direction are successful the loss will be considerably reduced; but the amount of the saving cannot be estimated so closely in advance as to be put into figures.

AREAS BURNED OVER, SEASON 1912.

	Total Acreage.
Island Division	6,830
Fraser Valley Division	2,605
Southern Coast Division	3,216
Northern Coast Division	8,020*
Atlin District	2,000*
Kitsalas Division	7,740*
Fort George Division (probably)	30,000
Quesnel Division (probably)	20,000
Lillooet Division	1,000*
Tete Jaune Cache Division	67,200
Kamloops Division	2,550
Revelstoke Division	2,595
Vernon Division	1,250*
Grand Forks Division	232
Nelson Division	350
Cranbrook Division	2,560
Fernie Division	200*
Total	158,348

THE WORK OF THE FIRE-PATROL FORCE.

In 1911 the force consisted of 110 District Wardens, who were directed by ten Divisional Wardens, who in turn were under the direction of two Supervisors of Wardens. In the past season the force consisted of two Supervisors, who were in charge of fourteen Divisional Wardens. In all, there were 16 Divisional Wardens in charge of 149 District Wardens. During the dangerous summer season there were also employed for areas of extreme hazard forty-eight special patrolmen, who were paid by the day.

The total area included within the sixteen divisions which were organized was about 125,000,000 acres, of which it is estimated that about 80,000,000 to 100,000,000 acres are covered with some kind of timber, and 50,000,000 to 65,000,000 acres were real forest land, covered with mature timber or valuable second growth. A very small area was denuded land in the process of regeneration. The headquarters and total area of each division and the number of District Wardens and the average area of the districts in each division are given below:—

(1.) *Vancouver Island.*—Headquarters, Victoria. Number of District Fire Wardens, 18; total area, 7,373,000; area per man, 409,722 acres.

(2.) *Lower Mainland Division.*—Headquarters, Vancouver. Number of District Fire Wardens, 20; total area, 4,700,000; average area per man, 235,000 acres.

(3.) *Southern Coast Division.*—Headquarters, Vancouver. Number of District Fire Wardens, 6; total area, 10,585,000; average area per man, 1,794,166 acres.

(4.) *Northern Coast Division.*—Headquarters, Prince Rupert. Number of District Fire Wardens, 3; total area, 18,580,000; average area per man, 6,193,333 acres.

(5.) *Atlin Division.*—Headquarters, Atlin City. Number of District Fire Wardens, 1;

(7.) *Fort George Division.*—Headquarters, South Fort George. Number of District Fire Wardens, 7; total area, 16,150,000; average area per man, 2,307,157 acres.

(8.) *Quesnel Division.*—Headquarters, Quesnel. Number of District Fire Wardens, 6; total area, 9,720,000; average area per man, 1,620,000 acres.

(9.) *Lillooet Division.*—Headquarters, Clinton. Number of District Fire Wardens, 6; total area, 12,540,000 acres.

(10.) *Tete Jaune Cache Division.*—Headquarters, Tete Jaune Cache. Number of District Fire Wardens, 7; total area, 4,780,000; average area per man, 682,757 acres.

(11.) *Kamloops Division.*—Headquarters, Kamloops. Number of District Fire Wardens, 7; total area, 3,600,000; average area per man, 604,285 acres.

(12.) *Vernon Division.*—Headquarters, Vernon. Number of District Wardens, 7; total area, 3,600,000; average area per man, 514,285 acres.

(13.) *Grand Forks Division.*—Headquarters, Grand Forks. Number of District Fire Wardens, 8; total area, 4,310,000; average area per man, 538,750 acres.

(14.) *Nelson Division.*—Headquarters, Nelson. Number of District Fire Wardens, 13; total area, 3,140,000; average area per man, 241,285 acres.

(15.) *Cranbrook Division.*—Headquarters, Cranbrook. Number of District Fire Wardens, 6; total area, 4,780,000; average area per man, 796,666 acres.

(16.) *Fernie Division.*—Headquarters, Fernie. Number of District Fire Wardens, 12; total area, 2,040,000; average area per man, 170,000 acres.

(17.) *Big Bend Division.*—Headquarters, Revelstoke. Number of District Fire Wardens, 2; total area, 2,590,000; average area per man, 1,295,000 acres.

(18.) *Selkirk Division.*—Headquarters, Revelstoke. Number of District Fire Wardens, 11; total area, 3,135,000; average area per man, 285,000 acres.

The principal features which decide the area that can be patrolled by one man are the degree of danger from fire, the number of burning permits to be granted, and the means of transportation and communication.

As shown above, the average area of the district patrolled by one man last season was about 900,000 acres, and the cost of patrol about one-seventh of a cent. per acre.

Owing to the extremely favourable weather conditions during the past season, the patrol force was not put to trial, and therefore the inadequacy of the present force to successfully meet a really bad fire season was not disclosed; but from the experience of all forest countries it is plain that the force in British Columbia will have to be materially increased before good forest-protection can be insured.

BURNING PERMITS.

The provisions of the "Forest Act," which requires that no fires be set for clearing land during the close season, which extends from May 1st to September 30th, was enforced by the patrol force, and the conditions imposed were, in the main, cheerfully accepted by the ranchers, settlers, and loggers. In all, 9,400 burning permits were issued by the Wardens, and of the large number of fires set, only eight escaped. Too much cannot be said for the good spirit shown by the settlers in doing everything possible to control and extinguish their fires. Below is given the number of permits issued in each Division:—

	Permits issued.
Vancouver Island Division	2,377
Lower Mainland Division	3,116
Southern Coast Division	156
Northern Coast Division	30
Atlin District Division	10
Skeena Division	80
Fort George Division	127

	Permits issued.
Brought forward	6,047
Kamloops Division	39
Revelstoke Division	650
Vernon Division	927
Grand Forks Division	226
Nelson Division	1,456
Cranbrook Division	79
Fernie Division	53
Total	9,477

VIOLATIONS OF THE FIRE-PROTECTIVE PROVISIONS OF THE "FOREST ACT."

Laws aimed to prevent the starting or spread of fires, must, if they are to prove effective, be vigorously enforced. This is important not only as a deterrent to persons who have a tendency to ignore the law, but also to call the attention of all citizens to the law, and inform them of its application. In the past the most frequent cause of fires, outside, perhaps, railways and logging operatons, was land-clearing by farmers. The railways and logging companies have been forced at considerable expense to install fire-protective devices, to furnish patrolmen and fire-fighting equipment, and to clear rights-of-way and other areas of inflammable material, and the adoption of such measures has resulted in a very marked reduction in the number of fires started by these agencies. It was, of course, comparatively easy to enforce the observance of the fire laws by the railways and logging companies, owing to their small number and prominence, and also to their financial responsibility. The situation is somewhat different with settlers. In the first place, it should be realized that the greatest difficulty the settler in British Columbia has to overcome is the forest cover, or the stumps and debris left from logging. Heavy expenditure of time and labour is necessary in many districts before the land can be cleared and crops can be put in. Even under the best conditions, the task of land-clearing is not easy; and since fire is practically the only means of clearing land, there is a constant temptation to use fire promiscuously, and without due consideration to the danger to surrounding property which always attends its use. The enforcement of the burning-permit regulation in consequence presents many difficulties, and it is not surprising that occasional settlers are found who will look upon this regulation with antagonism, and who set fire to their slashing at a time that, while it may give the cleanest kind of a burn, may also render the danger of fire escaping and spreading far greater than is justifiable.

Therefore, while the Government should make every effort to assist the settler in clearing his land, and should make it as convenient as possible for him to obtain permits promptly and without loss of time, the duty which the Government owes to the public generally in fire-protection makes it necessary that the permit regulation, as well as those aimed at the railways and logging companies, be enforced strictly.

During the close season, informations were laid against twenty-four persons for starting fires to clear land without a permit. Fines were imposed in five cases, amounting to $300. Six cases resulted in suspended sentences, with costs; twelve were dismissed and one withdrawn.

Summary.

Informations laid	24
Convictions secured	11
Dismissed	12
Withdrawn	1
Fines collected	$300.00
Costs	108.60
Appeal allowed in one case, fine and costs remitted; fine $50, costs	32.50

That part of the "Forest Act" dealing with fire-protection was printed in convenient pamphlet form and issued to the Wardens for distribution to ranchers, loggers, and other parties concerned. A variety of cloth posters were also printed, and these were displayed by the Wardens in conspicuous places along roads and trails, at camping-places, logging camps, and on buildings.

These posters were prepared in a striking way to attract the attention of passers-by, and it is thought they proved effective in keeping the danger of fire present in the public mind. A card was also printed and issued to the Wardens. These cards afforded a very convenient means of bringing the need for fire-protection home to campers and others, and they were widely distributed. The cards gave the name and address of the Fire Warden, so that persons receiving the card would know to whom to report fires which they might discover. Examples of the posters and style of appeal used are given below:—

CITIZENS:

LAST SUMMER THERE WERE—

73 forest fires caused by clearing land;
67 forest fires caused by campers;
37 forest fires caused by logging operations;
Besides railway and other fires.

$140,000 of public money was spent in fire-prevention. One bad fire cost $9,000 to fight.

Fine timber was wasted, houses were destroyed, pay-rolls and trade went up in smoke. Several men were ruined.

WHY?

Just because some one neglected his clearing fires.
Just because some one left a camp-fire smouldering.
Just because some one was careless with matches or tobacco.
Just because some one broke the law when using steam machinery.

Our forests yield $2,600,000 a year to the Government.

Natural resources provide the money for developing British Columbia. Lumbering circulates $24,800,000 a year among our people. YOU BENEFIT.

The best fire law in America was passed last winter in Victoria. HELP YOUR GOVERNMENT TO ENFORCE IT.

W. R. ROSS,
Minister of Lands.

Since many of the men employed by railways, in logging camps, mines, canneries, and in the fishing and other industries are foreigners, posters will be issued giving in condensed form the most important provisions of the law, and brief admonitions in regard to the proper use of fire, in different languages, such as Japanese, Hindustani, Chinook, Italian, Greek, and Chinese.

During the past season the Divisional Wardens submitted weekly lettergram reports giving local weather conditions during the week that affected the fire hazard, and also the number and seriousness of any fires which may have started. These bulletins kept headquarters advised as to the situation all over the Province, and facilitated prompt and effective action in the employment of extra patrolmen wherever the fire danger was serious. These reports also proved of great interest and value to the public, and were given wide publicity. This telegraphic service will be continued next year.

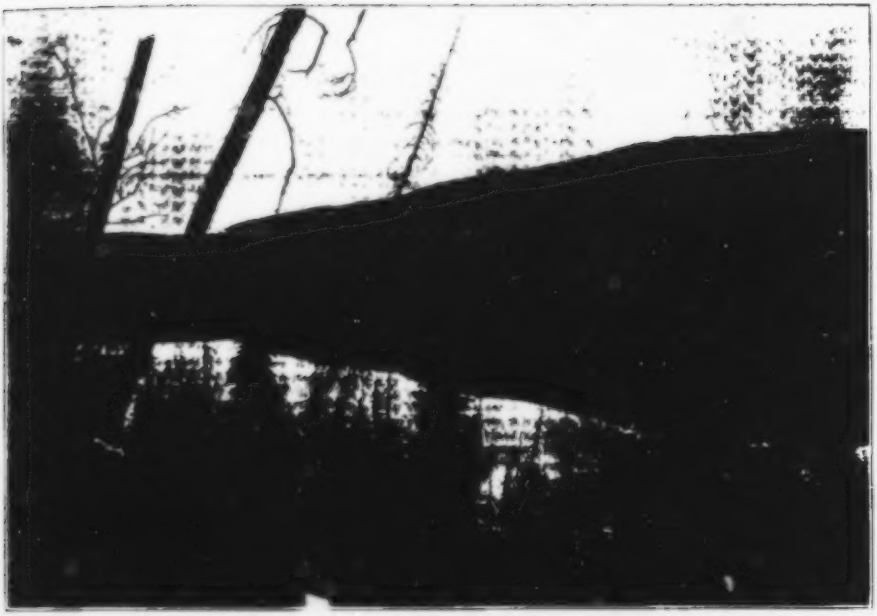
LOGGING OPERATIONS.

The most important provision of the "Forest Act" respecting logging operations have to do with the installation on donkey-engines of efficient spark-arresters and pumps with proper hose-connections, and the equipment by loggers of their own men and camps with suitable fire-fighting tools. At the commencement of the season regulations were prepared, printed on cloth, posted by the Wardens at all logging camps. The regulations are as follows:—

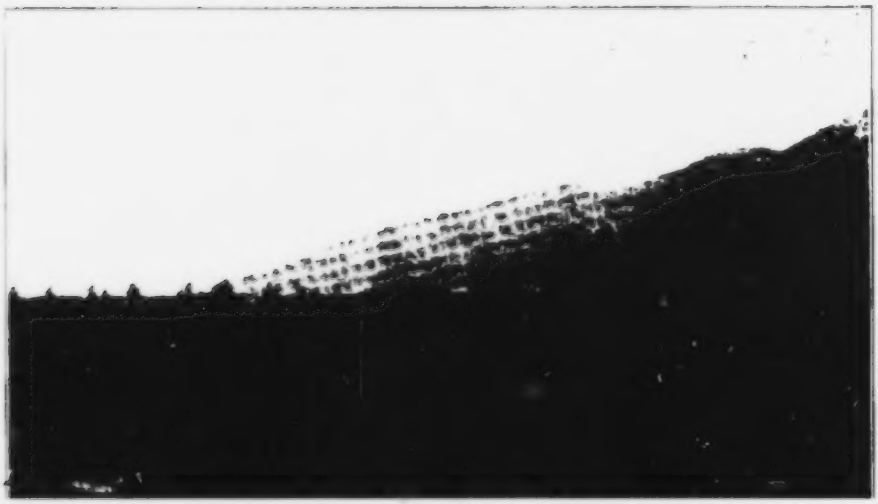
ENGINES.—Every donkey-engine and locomotive must be equipped with an efficient SPARK-ARRESTER and with devices which will prevent the escape of fire from ASH-PANS and FIRE-BOXES.

ASHES AND COALS.—ASH-PANS and FIRE-BOXES must not be emptied while locomotives are in motion. ASHES and COALS taken from ASH-PANS and FIRE-BOXES of locomotives and donkey-engines must be immediately extinguished with water, or placed in a safe pit, or on a spot of bare ground.

FIRE-FIGHTING TOOLS.—Every donkey-engine and locomotive must be provided with a sufficient supply of water and with a PUMP capable of forcing water to a height of 25 feet, 150 feet of [illegible]



Broad valley of lower end of Tsaytaiat Lake, Nation Lake District, heavily forested with Spruce.



CAMPS.—A sufficient space around all camp buildings must be cleared of brush and other fine combustible material.

SMOKING.—Lighted matches, cigars, cigarettes, and pipe-ashes must be completely extinguished before being thrown away.

RESPONSIBILITY.—Foremen, engineers, and all men working in the woods, as well as contractors, operators, and owners, are responsible for the carrying-out of these regulations.

W. R. ROSS,
Minister of Lands.

Victoria, May 1st, 1912.

During the season about 300 donkey-engines were inspected by the Wardens, and the fire-preventive devices and fire-fighting equipment were in general found to be in excellent shape, and generally up to the requirements. In a few cases, however, the Wardens found it necessary to order donkey-engines to stop operating until the necessary devices or equipment had been supplied. The effectiveness of the new regulations and their enforcement in preventing fire is shown by the fact that only eleven fires were started in logging camps, as against thirty-seven last year.

SAWMILLS, MINES, AND CAMPS.

The regulation requiring that inflammable material be cleared from a space around all camps, mines, sawmills, portable and stationary engines has not been strictly enforced during the past season, partly for the reason that the Wardens were not able to examine all the places involved, partly because the machinery necessary to enforce the law is not yet complete, and also because it was felt that before attempting to penalize infractions an attempt should be made to persuade the owners of such establishments to comply with the law voluntarily. The Wardens, therefore, were instructed to call the attention of mill and mine owners, men in charge of camps, and others to the provisions of the law, and to indicate what measures should be taken by them to comply with its intent. This policy will be continued next year, except where the conditions are exceptionally dangerous, in which case the owners will be given definite and detailed orders to comply with the Act.

Another provision of the "Forest Act" requires all mills and steam plants to equip their smoke-stacks or chimneys or waste-burners with spark-arresters, and prohibits the burning of wood-waste without proper safeguards.

Most of the large sawmills and steam plants have already complied with these restrictions, but a considerable number of small sawmills, especially in the interior, have failed, as yet, to install efficient waste-burners, and a number of complaints have been received in regard to such violations of the Act. Generally, the failure of these plants to construct safe waste-burners results in risk to the plant itself, as well as to the surrounding timber, and it is therefore to the owners' interest to install efficient and safe waste-burners. Hence but little trouble in general is expected.

DISPOSAL OF LOGGING-SLASH.

The Act provides that operators of logging camps may be required to construct fire-lines around their cut-over areas, and to cut down dead trees and stubs within such areas. The Act places, however, upon the logger no obligation to burn his slash. No attempt has been made during the past season to enforce the provision quoted above, but all the most dangerous slashings, aggregating over 60,000 acres, have been reported upon by the Wardens, and efforts have been made to get the loggers to burn their slash. Fortunately, a majority of the lumbermen are thoroughly convinced by past experience that a slash is bound to burn sooner or later, and that it is the best policy to burn it at a safe season under proper safeguards. It is usually possible to choose a time of the year when slight fire-lines only need to be constructed around the slash, and it is hoped that there will be but little need for enforcing provisions such as the above, which would inevitably put the operator to considerable expense.

The effective disposal of slash has been made an express condition of the free permits of timber for construction purposes conferred by their charters on railways, and regulations calling for the lopping of tops, piling of brush, and construction of fire-breaks are being enforced

been the cause of a great number of disastrous fires in the past, will be overcome. The adoption of this plan will, besides reducing the fire hazard, increase the safety of camps and equipment, and produce the most favourable condition for the regeneration of the forest.

In carrying out this necessary work, systematic study will be made to determine the best methods and the cost, results being carefully compiled and compared. A number of loggers have promised their assistance in conducting experiments, and it is hoped that information can be collected which will be a distinct help to all operators. It might be interesting in this connection to say that burning of logging-slashes by owners is compulsory under the laws of the States of Oregon and Washington, and that the work is not proving either difficult or costly. Under the charge of experienced men, by choosing the right weather conditions and by making a few preparations in the way of fire-breaks, the lumbermen of these States have found that slashings can be burned safely and at an expense varying from 15 to 50 cents an acre.

DISPOSAL OF DEBRIS ON RIGHTS-OF-WAY.

Roads, trails, power-lines, and the like, constructed through timbered land, are a very serious source of danger on account of carelessness of travellers with pipes, cigarettes, cigars, matches, and camp-fires. If the slash is left, the conditions are perfect for the starting of fires, which, owing to the amount of slash, are difficult to extinguish.

There is also great need for a network of fire-breaks in the timber regions to serve as a protection against conflagrations and to reduce the difficulty and expense of fighting them. Roads, trails, power and telephone lines, and other projects constitute a readily available means for the construction of such fire-breaks, and every advantage should be taken of them.

The "Forest Act" contains full provisions for the proper disposal of the debris resulting from the construction of such projects by private capital, and under these provisions railways, power-lines, logging-railways, and new telephone, etc., lines have been required to clear up slash.

The public roads should be a model as to the manner in which rights-of-way should be cleared. Owing to the need for the construction of a great number of new roads, many necessarily have been pushed through without clearing up the debris, and, of course, such work was not required in the past. As a result there are thousands of miles of roads whose rights-of-way are in bad shape, and which should be cleaned up in the interest of protection. New roads should be cleared as they are constructed, so as to avoid a second handling of the debris, and the double cost.

Orders were issued to the Wardens in the latter part of the season to make inspections and reports on the mileage requiring clearing, and an estimate of the cost that would be incurred in burning the debris off; 1,887 miles of public roads were inspected, and 1,386 miles were reported as needing attention, at an approximate cost of $63,472. In many instances the debris was in close vicinity to heavily timbered areas. These sections could be safely burned off, under supervision of the Wardens, in the early spring-time without any great risk of the fires getting beyond control.

The Department of Public Works has given the Forest Branch most valuable assistance in fighting fires. That Department has instructed all its road crews, which are distributed over the entire Province, to answer any calls for help, and this they have cheerfully done. The road crews often constitute the only labour within a radius of many miles, and were it not for their co-operation many fires would get beyond control before fire-fighters could be obtained from settlements. It is realized, however, that to call off road crews for fire-fighting often seriously delays completion of important construction-work, and it is the policy of the Forest Branch to refrain from calling on them unless other assistance is unavailable.

RAILWAYS.

It is a common remark that every timbered region traversed by a railway has been burned over. While the railways are undoubtedly not entirely to blame for this condition, it is nevertheless a fact that gross carelessness by the constructors in clearing the right-of-way, by engineers and firemen in the dumping of live coals outside of stations, by the failure

of Railway Commissioners for an order regulating the operation of railways in the Province with respect to the prevention of fires. The Board held an extended hearing last winter, and as a result prepared a set of regulations which may well be regarded as the last word on the subject.

The important provisions of these regulations are as follows:—

BOARD OF RAILWAY COMMISSIONERS (ORDER No. 16570).

2. Until further order, every railway subject to the legislative authority of the Parliament of Canada, under construction or being operated by steam, shall, unless exempted by a special order of the Board, cause every locomotive engine used on the said railway, or portion of railway, being constructed or operated by it to be fitted and kept fitted with netting-mesh as hereinafter set forth, namely:—

(a.) On every engine equipped with an extension smoke-box, the mesh shall not be larger than 2½ x 2½ per inch of No. 10 Birmingham wire gauge, and shall be placed in the smoke-box so as to extend completely over the aperture through which the smoke ascends, the openings of the said mesh not to exceed a quarter of an inch and one sixty-fourth (that is, seventeen sixty-fourths) of an inch to the square.

(b.) On every engine equipped with a diamond stack, the mesh shall not be more than 3 x 3 per inch of No. 10 Birmingham wire gauge, and shall be placed at the flare of the diamond of the stack, so as to cover the same completely, the openings of the said mesh not to exceed three-sixteenths and one sixty-fourth (that is, thirteen sixty-fourths) of an inch to the square.

3. Every such railway company shall cause—

(a.) The openings of the ash-pans on every locomotive engine used on the railway, or portion of railway, operated or being constructed by it to be covered, when practicable, with heavy sheet-iron dampers; and, if this is not practicable, with screen-netting dampers 2½ x 2½ per inch of No. 10 Birmingham wire gauge; such dampers to be fastened either by a heavy spring or by a split cotter and pins, or by such other method as may be approved by the Board.

(b.) Overflow-pipes from lifting injectors, or from water-pipes from injector-delivery pipe, or from boiler, to be put into the front and back part of the ash-pans and used from the first day of April to the first day of November, or during such portion of this period as the Board may prescribe, for wetting ash-pans.

4. Every such railway company shall provide inspectors at terminal or divisional points where its locomotive engines are housed and repaired; and cause them, in addition to the duties to which they may be assigned by the officials of the railway companies in charge of such terminal or divisional points,—

(a.) To examine, at least once a week,—

(1.) The nettings;
(2.) Dead-plates;
(3.) Ash-pans;
(4.) Dampers;
(5.) Slides; and
(6.) Any other fire-protective appliance or appliances used on any and all engines running into the said terminal or divisional points.

(b.) To keep a record of every inspection in a book to be furnished by the railway company for the purpose, showing—

(1.) The numbers of the engines inspected;
(2.) The date and hour of day of such inspection;
(3.) The condition of the said fire-protective appliances and arrangements; and
(4.) A record of repairs made in any of the above-mentioned fire-protective appliances.

The said book to be open for inspection by the Chief Fire Inspector or other authorized officer of the Board:

(c.) In case any of the said fire-protective appliances in any locomotive are found to be defective, said locomotive shall be removed from service, and shall not (during said prescribed period) be returned to service unless and until such defects are remedied:

(d.) Every such railway company shall also appoint one or more special inspectors, as may be needed, whose duties shall be to make an independent examination of the fire-protective appliances on all the locomotives of such company at least once each month, and report the condition of such fire-protective appliances direct to the Chief Mechanical Officer of the railway company, or other chief officer held responsible for the condition of the motive power of the said company.

5. Any authorized officer of the Board shall have power to inspect at any time any and all locomotives, and may remove from service any locomotive which is found to be defective in the said fire-protective appliances; and any such locomotive so removed from service shall not (during the said prescribed period) be returned to service unless and until such defects are remedied.

6. No employee of any such railway company shall—

(a.) Do, or in any way cause, damage to the netting on the engine smoke-stack or to the netting in the front end of such engine;

unnecessary combustible matter," no such railway company or its agents, employees, or contractors shall, between the first day of April and the first day of November, burn or cause to be burned any ties, cuttings, debris, or litter upon or near its right-of-way, except under such supervision as will prevent such fires from spreading beyond the strip being cleared. The Chief Fire Inspector or other authorized officer of the Board may require that no such burning be done along any specified portions of the line of any such railway, except with the written permission or under the direction of the Chief Fire Inspector or other authorized officer of the Board.

11. The railway company shall provide and maintain a force of fire rangers fit and sufficient for efficient patrol and fire-fighting duty during the period from the first day of April to the first day of November of each year; and the methods of such force shall be subject to the supervision and direction of the Chief Fire Inspector or other authorized officer of the Board.

12. The Chief Fire Inspector shall, each year, prepare and submit to each and every railway company a statement of the measures such railway companies shall take for the establishment and maintenance of said specially organized force. Said statements, among other matters, may provide for—

(*a.*) The number of men to be employed on the said force, their location and general duties, and the methods and frequency of the patrol;

(*b.*) The acquisition and location of necessary equipment for transporting the said force from place to place, and the acquisition and distribution of suitable fire-fighting tools; and

(*c.*) Any other measures which are considered by him to be essential for the immediate control of fire and may be adopted at reasonable expense.

13. Whenever and while all the locomotive engines used upon any such railway, or any portion of it, burn nothing but oil as fuel, during the aforesaid prescribed period, under such conditions as the Board may approve, the Board will relieve the said railway of such portions of these regulations as may seem to it safe and expedient.

14. The sectionmen and other employees, agents, and contractors of every such railway company shall take measures to report and extinguish fires on or near the right-of-way, as follows:—

(*a.*) Conductors, engineers, or trainsmen who discover or receive notice of the existence and location of a fire burning upon or near the right-of-way, or of a fire which threatens land adjacent to the right-of-way, shall report the same to the agent or persons in charge at the next point at which there shall be communication by telegraph or telephone, and to the first section employees passed. Notice of such fire shall also be given immediately by a system of warning-whistles:

(*b.*) It shall be the duty of the agent or person so informed to notify immediately the nearest forest officer and the nearest section employees of the railway of the existence and location of such fire:

(*c.*) When fire is discovered, presumably started by the railway, such sectionmen or other employees of the railway as are available shall, either independently or at the request of any authorized forest officer, proceed to the fire immediately and take action to extinguish it; provided such sectionmen or other employees are not at the time engaged in labours immediately necessary to the safety of trains:

(*d.*) In case the sectionmen or other employees available are not a sufficient force to extinguish the fire promptly, the railway company shall, either independently or at the request of any authorized forest officer, employ such other labourers as may be necessary to extinguish the fire; and as soon as a sufficient number of men, other than the sectionmen and other regular employees, shall be allowed to resume their regular duties.

NOTE.—Any fire starting or burning within 300 feet of the railway-track shall be presumed to have started from the railway, unless proof to the contrary is furnished.

15. Every such railway company shall give particular instructions to its employees in relation to the foregoing regulations, and shall cause appropriate notices to be posted at all stations along its line of railway.

16. Every such railway company allowing or permitting the violation of or in any respect contravening or failing to obey any of the foregoing regulations shall, in addition to any other liability which the said company may have incurred, be subject to a penalty of one hundred dollars for every such offence.

17. If any employee or other person included in the said regulations fails or neglects to obey the same, or any of them, he shall, in addition to any other liability which he may have incurred, be subject to a penalty of twenty-five dollars for every such offence.

(S'G'D.) D'ARCY SCOTT,
Assistant Chief Commissioner,
Board of Railway Commissioners for Canada.

Immediately after these regulations had been adopted, Mr. Clyde Leavitt, Chief Fire Inspector for the Board of Railway Commissioners, conferred in Victoria with the officials of the Forest Branch, and (the Board having no funds available for local inspection) a co-operative agreement was made with the Forest Branch by which the latter would inspect the railways and report failures to carry out the regulations. Specific orders requiring each company to maintain a force of patrolmen at definite points throughout the timbered districts were

Ninety per cent. of timber over area of 1,600 square miles in Omineca and Nation Lake Districts has been destroyed by fire.

Remnant of pure Douglas Fir Forest which covered large area in Nation Lake District. Latitude, 55° north.

Before the issuance of the regulations of the Railway Board, the Provincial Government had entered into a co-operative agreement with the Grand Trunk Pacific Railway Company, by the terms of which the railway company agreed to reimburse the Government for half the cost of preventing and fighting forest fires along the line of construction. It was found desirable to continue the arrangement, and therefore during the past season the Forest Branch appointed Wardens to supervise the clearing of the right-of-way and to take charge of any fire which may occur. It should be mentioned that this railway is also required to pile and burn all brush resulting from construction-work in a strip 50 feet wide on each side of the right-of-way. This gives a strip 100 feet wide on each side of the track, which, it is thought, will aid materially to prevent the spread of fires set by locomotives.

The patrol force employed on the G.T.P. Railway proved very effective, but unfortunately the northern portion of the Province experienced an unprecedented dry period in April and early May, accompanied by heavy winds, before the period at which, in ordinary years, there is need of fire patrol. As a result, an extremely serious and damaging fire occurred before the force was put on duty. During the remainder of the season, or until September, burning of brush was prohibited, except under very stringent conditions, and there was very little further trouble with fires from right-of-way burnings.

During the months of September, October, and November, Fire Inspectors have been engaged in the examination of the rights-of-way of the lines of the C.P.R., G.N.R., and Kettle River Valley Railways, preparatory to submitting annual reports to the Railway Board. These reports will contain revised plans for the patrol, fire-protective equipment, and right-of-way clearing for each line, and will be the basis of the orders issued for the coming year to the railways. Every effort will be made to give maximum protection to the timber and other combustible property along the railways, at a minimum expense to the railways.

Below are given portions of the order issued by the Chief Fire Inspector to the C.P.R. Railway, showing the scope of the regulations. This order contains, in condensed form, the details of the patrol required of this company. Excerpts from other orders are also shown, with the exception of the one applying to the main line of the C.P.R., which lies entirely in the Railway Belt, and is supervised by the Dominion Forest Branch. The orders differ only in the details of patrol required, since all the companies are subject to the general order quoted before.

ORDER OF JUNE 15TH, COVERING THE C.P.R.

So far as practicable, the work of patrol has been combined with the other regular duties of your employees; but where this action has not been specifically indicated, the patrol force is to be a specially organized and specially supervised body of men, who shall perform, to the exclusion of other duties, the patrol and other fire-protective work indicated in the regulations of the Board and specified hereinafter.

The details of the patrols required on Districts 1 and 2 of the British Columbia Division are as follows, it being understood that, unless otherwise specified, the patrol shall be continuous between the hours of seven in the morning and six in the evening of each day, including Sundays, with a minimum patrol of two round trips each day, one in the forenoon and one in the afternoon: —

Nicola Branch	2 patrolmen with velocipedes.
Gerrard and Lamb Branch	1 patrolman with power speeder.
Sandon-Nakusp Branch	2 patrolmen with power speeders.
Procter-Nelson and Castlegar Branch	Patrol by sectionmen two trips daily.
Slocan City Branch	1 patrolman with power speeder.
Castlegar-Rossland Branch	4 patrolmen with power speeder; 6 foot-patrolmen.
Grand Forks-Midway Branch	1 foot-patrolman; 3 patrolmen with velocipedes.
Greenwood-Motherlode Branch	1 foot-patrolman.
Eholt-Athelstan	1 foot-patrolman.
Reffek-Athelstan	1 foot-patrolman.
East Granby-Granby Smelter	1 foot-patrolman.
Crow's Nest Pass-Kootenay Landing	10 patrolmen with velocipedes; 2 foot patrolmen.
Cranbrook-Marysville Branch	1 patrolman with velocipede.
Yahk-Kingston Branch	1 patrolman with velocipede.
Caithness-Waldo Branch	1 patrolman with velocipede.

For the efficient inspection of and general supervision over the work of the railway companies under Order No. 10,570 of the Board, with particular reference to the patrol districts above specified in District 3 of the British Columbia Division, and in the British Columbia portion of District 3 of the Alberta Division, recommendations will be submitted for the designation by the Board of the following officials of the

(2.) The Assistant Forester in charge of Operation, Forest Branch, Department of Lands, to be designated Provincial Fire Inspector, to assist the Chief Provincial Fire Inspector:

(3.) A number of other employees of the Forest Branch, Department of Lands, to be designated Divisional Fire Inspectors, with headquarters at various convenient points throughout the Province, each to act as Inspector, under the regulations of the Board, over a specified portion of railway-line.

As a matter of record, all velocipede and power-speeder patrolmen passing telegraph-stations shall be reported the same as passing trains, and such records shall be freely open to the inspection of any authorized officer of the Board.

Each foot-patrolman shall be equipped with one shovel and one canvas bucket. Each speeder and velocipede-patrolman shall be equipped with two shovels, two canvas buckets, and one axe. In addition to the above and to the regular section equipment, there shall be stored at the tool-house for each section in each patrol district the following emergency fire-fighting equipment: One axe, three mattocks, and four buckets of not less than twelve quarts capacity each. Equipment for the transportation of patrolmen will also be furnished by the company as indicated. However, the use of power-speeders shall be established, as specified, at the earliest possible date after July 1st.

Whenever oil shall be used exclusively as fuel upon any portion of the railway-line in British Columbia, the matter of fire patrol upon such portion of the line may be handled by the track-walkers, section crews, and watchmen, in addition to their regular duties, provided the right-of-way shall have been cleared satisfactorily to the Chief Provincial Fire Inspector, or to the Chief Fire Inspector for the Railway Belt. Not less than one round trip per day shall be made over such portions of the line above specified. These men must, however, be specially instructed and specially supervised by the company.

The object ought to be obtained by the regulations of the Board, and by the instructions to be issued under them, is the prevention of railway fires. It is desired to avoid, as far as possible, the imposition of unnecessary expense upon the railway companies, and it is fully realized that the danger of fire will necessarily vary between wide limits during the long season prescribed by the regulations. There is no doubt that a very efficient system of fire patrol can be established at a minimum of expense, if proper provision is made for increasing or decreasing the force as conditions may require or permit. To this end an average patrol force has been prescribed with which to begin work, and the various Fire Inspectors to be authorized by the Board will be given authority to waive the requirements wholly or in part, from time to time, as may be practicable, it being understood that the Assistant Roadmasters will restore such patrol upon request of the Divisional Fire Inspectors, or other authorized officers of the Board. In order to make the system properly effective, it is essential also that your General Superintendents be authorized and directed to furnish additional men for patrol-work from time to time as requested by the Chief Fire Inspector for British Columbia, the Railway Belt, or Dominion Forest Reserves in Alberta, as the case may be. It is also essential that the necessity be impressed upon your employees of complying in the utmost good faith with the provisions of Regulation 14. In particular, sectionmen should be instructed that they must give the same attention to fire that they do to the safety of the track. On this basis it is believed that further damage by railway fires can be very nearly, if not quite, eliminated in the future, at a minimum of cost to the company.

In addition to the provisions of Regulation 14, each Roadmaster throughout the territory covered by the patrols specified in this letter shall be designated by the company as a Divisional Fire Ranger, each Section Foreman as a Sectional Fire Ranger, and each Locomotive Engineer as a Fire Ranger, and each shall be made specifically responsible for the proper carrying-out of the regulations of the Board on that portion of the railway-line to which he is assigned.

Whenever any new construction-work is to be undertaken by the company, either independently or through contractors, and whenever any additional portion of railway-line is to be placed under operation by the company, whether lines newly constructed, or lines purchased or under lease from other companies, information to that effect should be at once communicated to the Chief Fire Inspector for the Board of Railway Commissioners at Ottawa, Ontario, in order that suitable provision may be made for necessary fire patrol. Should any portion of the lines affected by this letter be sold or leased to another company, or ownership or control be otherwise disposed of, notice to that effect should be at once sent to the Chief Fire Inspector of the Board at Ottawa.

The work of removing all inflammable material from the right-of-way should be taken up vigorously, as required in section 297 of the "Railway Act."

In order to minimize as much as possible the danger of fire from smokers on railway-trains, notices should be posted in all passenger cars, and on the rear platforms of observation-cars, during the period from April 1st to November 1st of each year, requesting passengers not to throw lighted cigars or cigarettes from the train.

Porters and other employees on passenger-trains should be instructed to request the observance of this precaution by passengers, so far as possible. Suitable receptacles for cigar and cigarette stubs should be kept on the rear platforms of all observation-cars while cars are in use.

(Signed) CLYDE LEAVITT,
Chief Fire Inspector for the Board of Railway Commissioners.

PATROL REQUIRED FOR KOOTENAY CENTRAL (UNDER CONSTRUCTION).

Colvalli to end of track ..... 1 patrolman with velocipede.
Golden to end of track .....

of special patrols. However, in order to satisfactorily control the situation during the period before the use of oil-burners is made exclusive, you are notified that, by virtue of the authority conferred upon me as Chief Fire Inspector of the Board of Railway Commissioners, you are hereby required to establish and maintain a system of patrols following each coal-burning locomotive operated over any portion of your line.

It will be entirely satisfactory under the circumstances to have this patrol-work done by your section force or other regular employees. The patrol should follow each train within a sufficiently short time to ensure the early discovery of any fire starting from the locomotive. It is assumed that from fifteen to thirty minutes after each train will be most satisfactory.

SUMMARY OF PATROL REQUIRED ON GREAT NORTHERN.

Cascade Division (main and branch lines, Vancouver to Blaine), two patrols each day, by sectionmen or other employees to be designated by the Company, with such additional patrol at dry seasons as may be requested by the Chief Provincial Fire Inspector.

Boundary-line to Coalmont Branch	1 patrolman with power speeder.
Molson-Midway	1 patrolman with power speeder.
Laurier-Eight-mile Post	1 patrolman with power speeder.
Rossland-Patterson	2 foot-patrolmen.
Waneta-Nelson	2 patrolmen with power speeder.
Port Hill-Wyndel	1 patrolman with velocipede.
Gateway-Michel	2 patrolmen with power speeders.

PATROLS ON VICTORIA & SIDNEY RAILWAY.

(1.) Between Victoria and Royal Oak, no special patrol will be necessary.

(2.) Between Royal Oak and Sidney, two patrols each day by sectionmen or other employees.

(3.) Each locomotive operated by the company shall be equipped with 150 feet of 1-inch hose, with necessary facilities for attaching to the injector feed-pipe.

(4.) The engineer of each train shall be required to keep a look-out for fires along the track, and if it is possible for the train crew to extinguish any fire so discovered, to stop the train and notify the conductor, whose duty it shall be to extinguish the fire. If the fire cannot be so extinguished, the engineer will notify the nearest section foreman at the earliest possible moment, who shall immediately proceed to the fire and extinguish it.

(5.) The company shall, so far as practicable, make arrangements with the city water-station on Elk Lake, and with suitable persons having telephone service at Keating, Saanichton, at Basin Bay Brick Co., and with James A. Johnson, and with a resident in the vicinity of Elk Lake, under which arrangement the section foreman or the Victoria office of the company will be notified immediately of any fire discovered burning along the right-of-way.

PATROL ON GRAND TRUNK PACIFIC RAILWAY.

Between Yellowhead and Tote Jaune Cache, four men with velocipedes.

On all that portion of the line on which construction-work is being done between Mile-point 1,099.6, and the end of the steel which is being laid eastward from Prince Rupert, B.C., one foot-patrolman shall be assigned for each ten miles of the line under construction. In addition to the patrolling of the right-of-way, each such patrolman shall also patrol the tote-roads between lines drawn at right angles to the ends of the railway-line under his protection. The attention to be given the tote-road patrol shall be equal to that given along the right-of-way.

Between Prince Rupert and the end of the track now being laid eastward from that point, a distance of approximately 160 miles, one man with velocipede shall be furnished for patrol and fire-fighting work for each twenty miles.

As the work of track-laying progresses westward and eastward from the above-mentioned points toward a common point, a patrol shall be established and maintained by the company at least as efficient as that above prescribed.

Some of the railway companies were unable to put on the patrols called for by the above orders, on account of inability to obtain the necessary equipment, and for other reasons, but next year they promise to be fully prepared.

During the fall all railways have taken up the work of clearing their right-of-way of inflammable material, which in general is progressing satisfactorily. It is probable that by the beginning of the fire season next spring all the really dangerous stretches of right-of-way will have been cleared up, thus greatly reducing the fire hazard.

PROVINCIAL RAILWAYS.

All of the lines of the Canadian Northern Pacific in British Columbia and the line of the Pacific Great Eastern are under Provincial charter, and come under the provisions of

also provides that the right-of-way be cleared of inflammable debris, and that no debris resulting from construction shall be left on private land adjoining the right-of-way; and that before regular train service is begun the railway company must obtain a certificate from the Minister of Lands certifying that the work has been satisfactorily performed.

Under the above provisions the Forest Branch placed five patrolmen on the Vancouver Island branch of the C.N.P. Railway. Under the supervision of these patrolmen the clearing of the right-of-way was performed satisfactorily, and with the exception of a few places the debris caused by the construction of the railway on adjoining lands was also efficiently disposed of. The few places which were not cleared up will be dealt with before a certificate is issued.

Only one fire escaped from right-of-way burnings on this line, and covered 200 or 300 acres. No damage to commercial timber was inflicted.

The line of the C.N.P. Railway from Vancouver to Kamloops runs either through settlements or along the precipitous rocky sides of the Fraser River canyon, and the danger of fire not being great, the railway was not required to employ special patrolmen. The work was frequently inspected, however, and the Forest Branch is ready to recommend the issuance of a certificate for the line between Westminster and Hope, a distance of eighty-five miles.

From Kamloops north, the C.N.P. Railway let contracts last season for the construction of 120 miles of line. Except for a distance of about twenty miles from Kamloops north, the line runs through a heavily timbered district, and special patrolmen were employed by the Forest Branch to supervise the clearing of right-of-way, the men being paid by the railway company.

No trouble with fires occurred, and the right-of-way was well cleared as the work proceeded. Contract for another 100 miles of line has been let, and this work also will be carefully supervised, since it is all through heavy timber.

On the eastern end of the C.N.P. Railway, contract has been let for the stretch between Yellowhead Pass and Albreda Summit. Right-of-way clearing has already commenced, and under the supervision of officers of the Forest Branch the work of clearing the right-of-way is being performed satisfactorily.

Contracts for the construction of portions of the Pacific Great Eastern were let last summer, and work has already commenced on Howe Sound and at Lillooet. Instructions have been issued to the contractors in regard to the requirements of the Act as regards clearing the right-of-way and disposing of debris caused by construction on adjoining property, and the work will be periodically inspected during the winter by an officer of the Branch. Early in spring, patrolmen whose salary will be paid by the company will be employed. Before any of the above lines commence operations, orders will be issued in accordance with the provisions of the Act, specifying the fire-protective measures which must be adopted, including the installation of efficient spark-arresters and other appliances designed to prevent the escape of fire from the locomotives and trains, the furnishing of fire-fighting equipment, and the establishment of a system of patrol to prevent, discover, report, and extinguish fires occurring within 200 feet of the track. It is felt that the enforcement of these regulations will effectively protect the property adjacent to the right-of-way from danger from fires due to the operation of the railways, and that a repetition of the history of older railways, as regards the devastation of the territory through which they run, will be prevented.

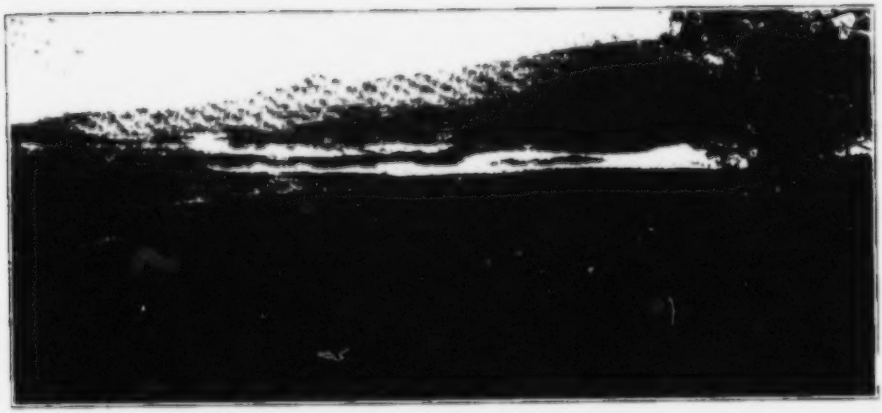
The attitude taken by the representatives of all the railways now constructing in the Province toward the fire-protection work has been excellent. With few exceptions the officers of the railway and also the contractors have appreciated the importance of taking precautions against fire, and have cheerfully carried out the regulations.

PERMANENT IMPROVEMENTS.

GENERAL.

Few forest regions under administration are provided with such compartively slight means of transportation, communication, and shelter as the greater part of British Columbia. Tracts as large as the whole of some of the

Cabin constructed by pre-emptor, Upper Fraser Valley.



Burns Lake, Bulkley Valley.

Cedar, Fir, Tamarac, and Hemlock in Wet Belt, West Kootenay.

a region. Before there is any possibility of preventing and controlling fires, trails, roads, telephone-lines, and cabins for the use by the Rangers must be constructed. A beginning was made last season upon a preliminary plan for such improvements, and a list of some of the roads, trails, and telephone-lines most badly needed has been prepared.

With regard to roads, a road paralleling the Big Bend of the Columbia River, and extending to Tete Jaune Cache, and one from Jordan River to Barclay Sound, are among the most essential.

Below is given a list of important trunk telephone-lines, which there is little chance will ever be constructed by private companies or by the Dominion. These lines are urgently needed in the interest of forest-protection. Their construction will save money, both in timber and in the number of men needed for patrol. To build these lines (which should, so far as possible, be tree-lines to save expense) an expert telephone-man experienced in this sort of work will be employed to prepare standard plans, start crews, and to supervise the construction as it proceeds. The field-work will be performed under the direction of regular officers of the Forest Branch.

TELEPHONE-LINES.

	Miles.
Coast Division—	
From Hope to Steamboat Mountain	40
From Harrison to upper end of Harrison Lake	60
From Newport up to head of Mamquam River	25
Island Division—	
From Campbell River to Port Hardy and Quatsino Sound	125
Fernie Division—	
Sparwood up Elk River	40
Canal Flats to Cross River	40
Revelstoke Division—	
Howser up to Duncan River	35
Revelstoke to and up Canoe River	120
From Beaver Mouth to Canoe River	70
Vernon Division—	
Vernon to West Bridge via Manashee and Kettle River	100
Grand Forks Division—	
Princeton up Similkameen River	30
Kamloops Division—	
From North Thompson River up the Clearwater to Quesnel Lakes	75
Tete Jaune Cache Division —	
From Fraser River up the North Fork of Fraser	75
Fort George Division—	
Up the Nechaco River to Fort St. James	30
Kitsalas Division—	
Kitsalas to Kitimat Arm	40
Kitsalas to head of Kitsumgallum Lake	40

As rapidly as possible, the number and locations of the urgently necessary ranger-cabins is being determined. Plans for cabin-building will be ready in time for a beginning this coming season; and some of the most imporant cabins will be constructed during the fall and winter by the regular employees, since weather conditions at that time will largely prevent other work.

The trails needed to permit of a proper patrol, to render it possible to reach fires quickly, and to reach high points which can be used as look-out stations, amount in the aggregate to thousands of miles. Many of these trails are short and can be constructed by the Rangers and patrolmen when favourable weather conditions render patrol [illegible]

CURRENT WORK IN PERMANENT IMPROVEMENTS.

As weather permits, work will begin upon the following urgently needed permanent improvements during the present fiscal year:—

FIELD TELEPHONE-LINES.

	Miles.
Revelstoke to Canoe River	100
Howser up Duncan River	15
Sparwood up Elk River	15
Campbell River to and down Salmon River	45

TRAILS.

	Miles.
1. Arrow Park to Whatshan Lake	7
2. Along east side of Sugar Lake north	10
3. From Canal Flats up Kootenay and White River	16
4. Gold Creek to Moyie Mountain to Meadow Creek	20
5. Christina Lake north	15
6. Up North Fork of Fraser River	20
7. Lakelse Lake to Kitinat, opening up old trail	40
8. Up Rau Shuswap River	20
9. From tide-water up Gold River in co-operation with Public Works Department, C.N.P. Railway, and timber-owners	15

LAUNCHES.

Bids have been requested for the construction of four 36-foot launches and two 54-foot launches for Coast service, and two 25-foot launches for the Kootenay and Arrow Lakes. Besides these boats, canoes and rowboats will be needed for use on the lakes and rivers of the interior.

LAND CLASSIFICATION.

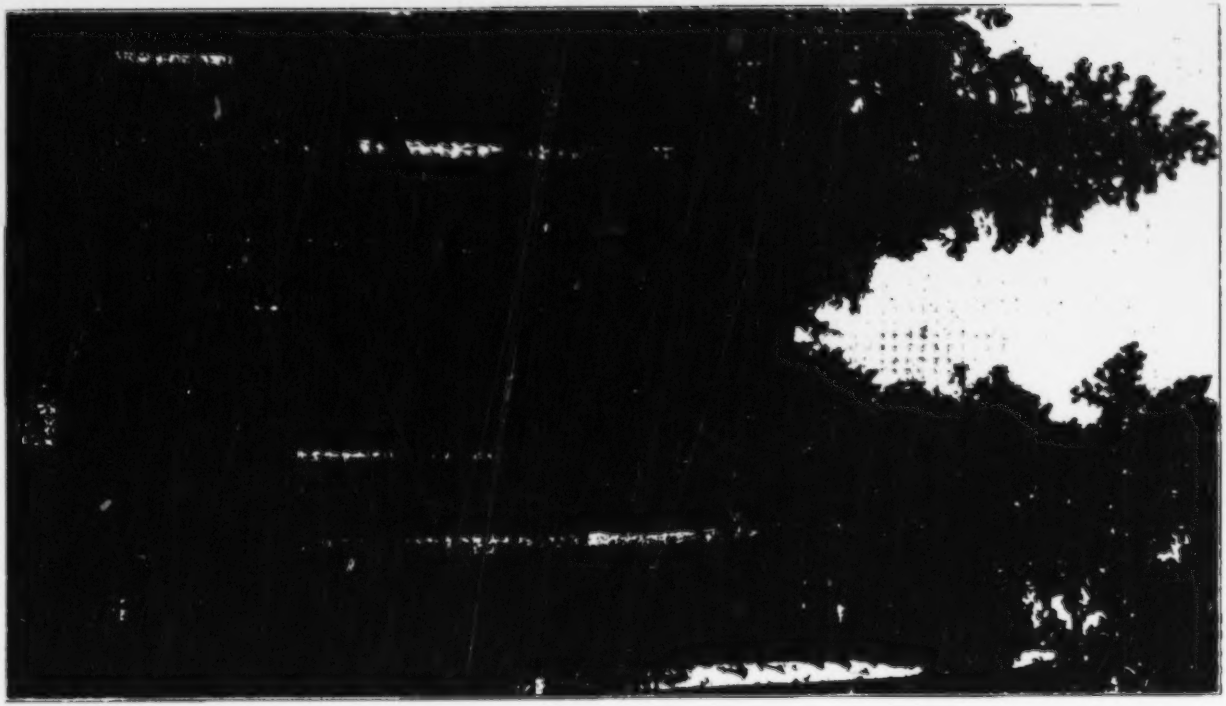
While it is true that, owing to climatic and topographic factors, the proportion of agricultural land to the whole area of the Province is smaller than in the Prairie Provinces, it is nevertheless true that the agricultural possibilities of British Columbia are generally underestimated, and that when all the tillable lands are under cultivation, and when all the grazing lands are made use of for stock-raising, the agricultural industry will easily rank with the lumber industry in importance.

A great portion of these agricultural lands are, however, at the present time covered with a valuable growth of timber. In accordance with the highest practice of conservation, the Provincial Legislature has withheld these timbered agricultural lands from settlement until the timber-crop could be removed. At the same time, however, it has also most wisely made provisions for enforcing the prompt removal of the timber-crop from agricultural lands, thus preventing the locking-up of such lands from settlement for an indefinite period.

Considerable areas of these timbered agricultural lands are located within timber leases and licences, and larger areas in the most inaccessible regions are held by the Crown, but reserved from pre-emption or sale if they bear timber in excess of 8,000 feet to the acre west, or 5,000 feet to the acre east, of the Cascades.

As regards the lands held under lease or licence, the Act requires that all lapsed timber leases and licences be held in reserve until they are examined by the Forest Branch, in order to determine whether the lands have no value except for the production of timber and should therefore be held as forest reserves, or whether they are agricultural in character and should be opened to pre-emption or sale.

During the past season fifty expired leases and licences, aggregating in area about 40,000 acres, have been examined by the Forest Branch, and as a result several thousand acres [illegible]



ENFORCED CUTTING OF TIMBER ON AGRICULTURAL LAND COVERED BY LEASES AND LICENCES.

The "Forest Act" also provides that when land contained in timber licences is found to be fit for agriculture, the holder of such a licence may be required to remove the timber therefrom in a specified time, after the expiration of which time the licence will be cancelled and the agricultural land opened to settlement.

Before this provision of the "Forest Act" can be efficiently applied, it will be necessary for the Forest Branch to know for each specific case whether the land is agricultural, and how fast, in fairness to its owner, the timber can and should be removed. This calls for expert examination on these lands of an exceedingly thorough kind, for which definite provision should be made.

THE LIVE-STOCK INDUSTRY.

A most important natural resource of British Columbia, which is scarcely utilized at all at the present time, is the forage produced both in the timber and in the meadows and parks of the mountain-slopes and plateaux of the interior.

The extent and potential value of this resource is but little appreciated. It is conservatively estimated that there is in the interior, south of the line of the Grand Trunk Pacific Railway 3,000,000 acres of mountain meadow and park land, and at least 10,000,000 acres of first class timbered grazing land, capable of furnishing summer-grazing for upwards of 1,000,000 head of cattle or 5,000,000 head of sheep. This vast range is supporting at the present time not more than 50,000 head of cattle and horses. Sheep-herding on the open range is not practised in the Province as in the Western United States, and it is doubtful whether sufficient winter range exists to permit of it. The cattle, and particularly the dairy industry, however, can be developed to take advantage of the grazing land described above, and provisions should be made by the Government to render this valuable resource available to the settler who is without capital to buy large tracts of land outright. Fortunately most of these grazing lands are still owned by the Province, either as Crown lands or as timber limits. Further, these lands are, for the most part, capable of producing valuable timber at the same time that the forage is being utilized, if the grazing is conservatively regulated, and it is generally recognized that the best method of disposing of the forage is by a permit system. The carrying-capacity of the land is estimated, and the permittee pays on a basis of so-much per head, instead of an acreage basis. By such a system the rancher is able to start his live-stock or dairy business with a minimum of capital, and to receive protection from competitors in the use of the range, while the Government receives a fair revenue, and by limiting the number of stock grazed to the actual carrying-capacity of the land, preserves the timber-growth and protects the land from the serious and lasting results of overgrazing.

Another very important result of the use of the mountain lands for grazing is its decided influence in reducing the danger from forest fires. Grazing prevents the accumulation of grass and leaves, increases the rapidity of decomposition of the dead material, and also makes trails; all of which greatly decreases the fire hazard, and cost and difficulty of fire-fighting. Further, the stockmen open up the country with roads and trails, and, being present during the dangerous fire season, are able to give prompt assistance if fire breaks out.

It is therefore important from every point of view that complete information in regard to the location and carrying-capacity of the valuable grazing lands, and the best means of utilizing them, be collected and put before the public, and a definite plan prepared for the use of the public range.

The collection of such information is being made a part of the work both of the forest survey parties and the members of the regular force. Maps will be prepared, classifying the forage according to its utility for horses, cattle, or sheep; the seasons during which it can be used, whether the spring, summer, fall or winter; and whether it is already being used, or is unused at present. Definite recommendations will also be made as to the terms on which leases should be let, including the grazing period and the fees.

The above plans apply, of course, only to those lands which are valuable for the produc-

FOREST RESERVES.

There are in the entire Province over 100,000,000 acres of timber land, of which about 65,000,000 acres possess a topography and soil which will permit of the production of merchantable timber, which eventually, when transportation means become available, can be profitably logged. This immense area is unsuitable for agriculture, and, outside of the forage which grows upon it and which some time will be used for grazing, the only value which practically all this land has is for the production of timber.

It is impossible to estimate in dollars the approximate value of this vast resource. The annual production of these 65,000,000 acres of forest land would be, under proper management and protection, certainly not less than 6,500,000,000 B.F., and as utilization grows closer, greatly in excess of this amount. Even at the low average rate of $1 per thousand feet, this would mean a return to the Government from the forests of British Columbia of $6,500,000 a year. Clearly, however, the inevitable increase in stumpage values will raise the ultimate revenue of British Columbia from her forests to several times this amount.

To ensure the production in perpetuity of this timber-crop, the timber lands of the Province must first of all be protected from fire; second, the timber must be cut in a manner to obtain the maximum yield per acre; and, lastly, deforested lands must be made. This great work, with the success of which the future of the Province is inseparably bound, can only be accomplished by a broad and definite policy of forest conservation. The first, and most urgent, step in the development of such a policy is the establishment as forest reserves of those areas needed in the public interest for the protection of stream-flow and the protection of timber, and which are unsuited for agricultural use.

It is extremely important that these reserves be established at the earliest possible date. No restrictions whatever should be placed on the location of mineral lands in forest reserves, but, inasmuch as the use of the land for mineral development will only be temporary, while the land can always be used for timber-production. Within these reserves, complete title to rights, as far as the production of timber is concerned, should remain with the Crown. The Government should, however, be liberal in granting timber free of charge for mining purposes, up to the point where the mine becomes productive and ships coal, ore, or oil.

The grazing lands of the Province, which are discussed elsewhere in this report, constitute a very valuable resource which will never be fully utilized until the agricultural lands are settled upon by *bona-fide* farmers and stockmen. Owing to the high cost of clearing land and otherwise bringing a farm to a point where it will support a family, it will be necessary to offer the settlers every inducement, one of which should be free grazing privileges for a certain number of live-stock. Settlers can only be protected from unfair competition in the use of the range by the inclusion of the timbered grazing lands within forest reserves, and the control of grazing privileges by the Government.

At the present time there are timber leases and licences which contain valuable agricultural land, or which are located close to growing towns, which may be found to retard the natural development of the community. Owing to the condition of the lumber industry at the present time, hardship might be incurred by the owners of such leases and licences through the enforcement of the provisions of the Act respecting the enforced cutting of timber, but it is entirely possible that an exchange of these lands could be made for vacant Crown timber lands through the means provided by the section of the "Forest Act" dealing with the creation of forest reserves.

It should not be understood that the creation of these reserves will in any way retard the development of any agricultural lands, or of coal, oil, or mineral land, which may be included in them. Provision should be made for the prompt exclusion of valuable agricultural lands, and, as has been stated before, the only restriction which should be placed on the location of coal, oil, or mineral lands in forest reserves should be the reservation of the timber and the surface rights of the land for the production of timber.

In this connection it is interesting to note that the Dominion Government has placed in permanent reserves the entire east slope of the Rocky Mountains in Alberta, containing nearly 12,000,000 acres; 2,250,000 acres in Manitoba; 600,000 acres in Saskatchewan; and

ORGANIZATION.

The portion of the Province in which the existence of settlement and industries requires the establishment of field offices of the Forest Branch now extends from the International Boundary north to the line of the Grand Trunk Pacific, and includes the entire length of the coast-line and all the islands along the coast. In the past, the region south of the Railway Belt and the Lower Mainland and Vancouver Island have been the only ones in which the business of the Department required a permanent organization, but the construction of the G.T.P. Railway, the C.N.P. Railway, and the P.G.E. Railway are opening up vast areas in which there will take place a great development, already begun, in the lumber industry, demanding the presence of forest officers to attend to the collection of revenue, to make timber-sales, and to examine lands to determine whether they come within the legal classification of timber lands. This portion of the Province, containing approximately 125,000,000 acres, will be added to by the construction of railroads in the near future into the Peace River country, and elsewhere also.

The organization of this latter territory, so far as the transaction of forest business is concerned, can probably wait a few years, but complaints in regard to forest fires have already been received, and it will probably be necessary to organize these comparatively inaccessible districts for fire-protection purposes next year.

Disregarding these last areas, however, and restricting the establishment of forest offices to the territory in which there is regular business besides forest protection, we have an area of 125,000,000 acres, of which probably 100,000,000 acres is covered with some kind of forest, and of which probably 65,000,000 acres bears or can bear merchantable timber. To administer efficiently the forest business in this vast territory and to protect effectively the timber within it from fire is the chief problem before the Forest Branch.

In the past, the organization has been built up along independent lines. There was a Timber Inspection Branch, which collected royalties and looked after trespass cases; a Scaling Branch, which attended to the official scaling of logs and the determination of the amounts of timber cut as a check for the Timber Inspection Branch, and, lastly, a Forest Protection Branch, whose duty it was to issue burning permits, prevent and fight forest fires, and otherwise carry out the provisions of the law. These three staffs were under separate managements and disconnected. The employees of the Timber Inspection and Scaling Branches were on duty throughout the year, while the Fire Wardens were only employed for five months during the dangerous season. While it is probable that such a plan of organization develops men specially qualified in particular lines, it is also true that it results in much duplication of work and unnecessary travel, while members of one branch fail to profit by the knowledge and experience of the other branches. It is consequently far more expensive, and the different terms of employement cause jealousies and antagonisms between the men. The system has been tried out in nearly all forest countries, and has been abandoned on account of its expense and the difficulty of supervision and control.

The plan of organization adopted in practically every country owning forests is one which the entire responsibilty for the administration and protection of the forests within a certain district is placed on one man, who reports direct to headquarters. He is, in fact, a district manager. The district is in turn divided into smaller districts, all the business on each of which is in charge of a surbordinate officer reporting to the district manager. If there is work which calls for qualifications of a technical nature, specialists are assigned, either temporarily or permanently, to the district manager. In this way the authority and responsibility are centred to one man; there is never any conflict in authority; and the danger of strife and jealousy arising between men belonging to the same department is almost entirely eliminated.

This system which naturally develops men of all-round ability and experience, and affords much greater opportunities for rapid advancement than one founded on the specialist plan, is a very important factor in attracting and holding good men in the service. Another advantage over the specialist plan is that it is easily understood by the public, since all business relating

DISTRICT FORESTERS.

Until a larger number of men well qualified by training, experience, and ability are available, very large districts only can be established. As the business of these forest districts increases, however, demanding a more intensive administration, and as trained men become available, the larger districts should be subdivided. The men in charge of the forest districts will be called District Foresters. Each of them will be entirely responsible for the conduct of all the work in his district, and will therefore be in the field a large part of his time. Such officers will be expected to make themselves familiar with conditions in every portion of their district—with each sawmill, logging operation, and timber-sale; with agricultural conditions and the need for land classification; with all fire-protection and improvement work; and with the work of each subordinate.

FOREST ASSISTANTS.

When work of a technical nature, such as land classification, forest surveying and cruising, arises in a district, it will (until the members of the local force become qualified) necessarily be performed by Forest Assistants, who must be temporarily or permanently assigned, under the direction of the District Forester, to a district needing their services. Only men who have had a thorough technical training will be appointed Forest Assistants.

HEAD RANGERS.

Owing to the size of the districts, the District Foresters will require assistants to help in supervising field-work, particularly the protective work, and for this purpose one or more Head Rangers will be appointed in each forest district. These Head Rangers will be given such authority as in the opinion of the District Forester is advisable, but ordinarily each should have full charge of field-work in a specified portion of a district. Head Rangers should be kept on duty throughout the year.

RANGERS.

The routine work involved in the supervision of timber-cutting, in the examination and classification of lands, in granting burning permits, in other fire-protective work, and in the construction of improvements will be performed by Forest Rangers.

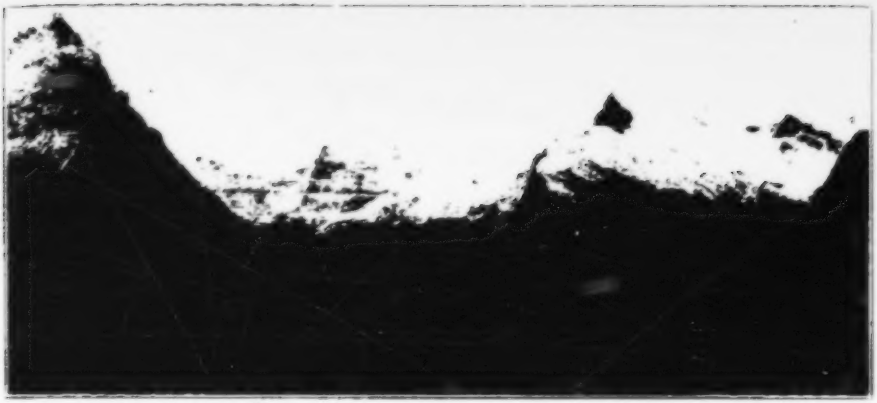
Appointment of Rangers should be confined to citizens of British Columbia who are not more than forty years of age, who are qualified by training and experience to perform the work, and who are physically capable of hard work. Probably several different grades of Rangers, such as District and Assistant Forest Rangers, will have to be established. District Rangers would be kept on duty throughout the year and would be eligible for appointment as Head Rangers.

FOREST GUARDS.

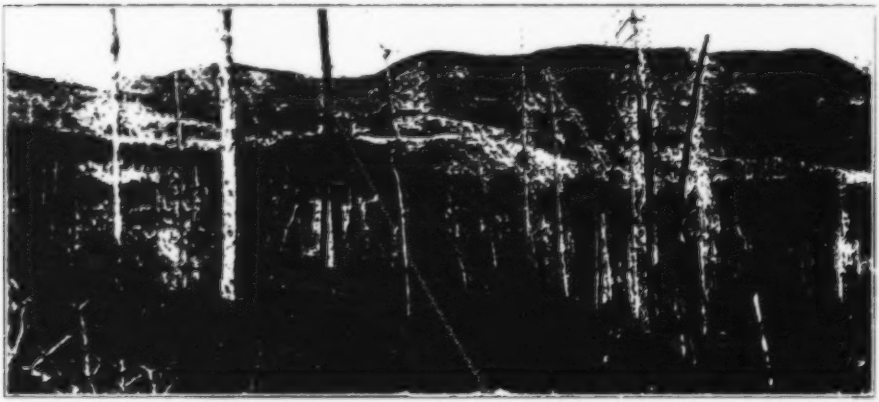
Work of a non-technical character, such as patrol for fire and assisting Forest Rangers and Forest Assistants, can be performed by Forest Guards on temporary appointment. Experience as a Forest Guard should in general be considered an essential qualification for a Ranger.

RECORDS.

It is but twelve years since the office-work in connection with the administration of the Provincial forests occupied the attention of one official in the Lands Department at Victoria. The issue of an occasional timber lease; the receipt of rental from some 220 leases and the registration of their assignments; the issue to applicants of perhaps 150 annual licences to cut timber on vacant Crown lands; and the copywriting of marks with which lumbermen might desire to brand their logs—this comprised the duty of the staff of one. Since the Timber Inspector's office at Vancouver collected the royalty paid on cut timber and forwarded this to the head office at regular intervals for transmission to the Treasury, the supervision of cutting operations created practically no headquarter clerical work; and the Forest Protection



Upper Valley, Moose River, Yellowhead Pass, heavily forested with Spruce and Lodge-pole Pine



Immense forests have been destroyed by fire in Bulkley Valley.

Survey Branch and in the Department generally by the staking of 15,000 square miles of unsurveyed Crown lands, the services of four additional officials were required to cope directly with the licence records themselves, and with the receipt of as much as $2,300,000 in a year from this new source of revenue. Several changes—such, for instance, as the surrender of 12,000 twenty-one-year licences and the reissue in their place of perpetual licences—have made very heavy increases from time to time in the current work, and have handicapped the staff in the constant struggle with arrears. A sum of about $800,000 placed in a Trust Deposit Account awaiting attention shows how heavy these arrears have been.

In 1911 the Forest Protection Service had come into existence, and both the correspondence concerning it and the supervision of the accounts of the ten divisions and 110* fire districts of the Province still further increased the office force, which in one part or another of the Lands Department was engaged in forest business. The expansion of the lumbering business had also given rise to a correspondence with the Timber Office at Vancouver, the burden of which fell chiefly on the Deputy Minister or the Minister himself.

At the time of the passage of the "Forest Act," in February, 1912, there were thus four separate sections of the Department, each of which was concerned with a different form of timber business. The Government had been awaiting the passage of that Act to create a branch of the Department which should assemble and bind together all forest-work and the staff engaged in doing it; and without loss of time—in April of this year—the Records Office of the new branch was consequently brought into existence as an amalgamation of the existing clerical forces.

Office reorganization was, however, not the most pressing task of the new forest service. The planning of a field programme, the establishment of fresh lines of work, the many difficulties that naturally occur when considerable changes in procedure are made in a Government department, and the rapidly increasing amount of current routine work absorbed practically the whole energy of the staff for the first four months, while preparations for the Convention of the Canadian Forestry Association, held in Victoria in September, made a further demand upon the time and attention of officials who would otherwise have been engaged in studying office efficiency. Throughout this period constructive work was hampered by the absence of suitable quarters, and it was not until the end of October that the wanderings of the scattered staff from one committee-room and basement to another were brought to an end by completion of the present office building. Even so, November was nearly over before the licence records could be transferred and the entire office force gathered under one roof. The inevitable delays that have occurred in the completion of the large amount of printing and the diverse material required in providing the necessary supply of more than fifty forms of card records, account-books, and other stationery equipment for the new office, and in the delivery of filing-cases and furniture, have also helped to prevent the actual carrying-out of the changes contemplated. The plans for these have, however, been worked out carefully, and the delay in executing them has been in some ways an advantage. Hurried changes lead to mistakes, and a mistake involving 15,000 records (as in the case of licences) would be a very serious matter.

The preparatory stage in office organization is, however, practically at an end, and with the new year the new system of records will be brought into use. It is impossible at present to foresee just what clerical force will be needed to do the work, for though labour may be economized by short cuts and by getting rid of duplication and unnecessary routine, yet it will be largely increased in other directions by the necessity of helping the men in the field by keeping systematic records of many matters which have hitherto received no attention, and by supplying prompt information both to these men and to the public.

OFFICE ORGANIZATION.

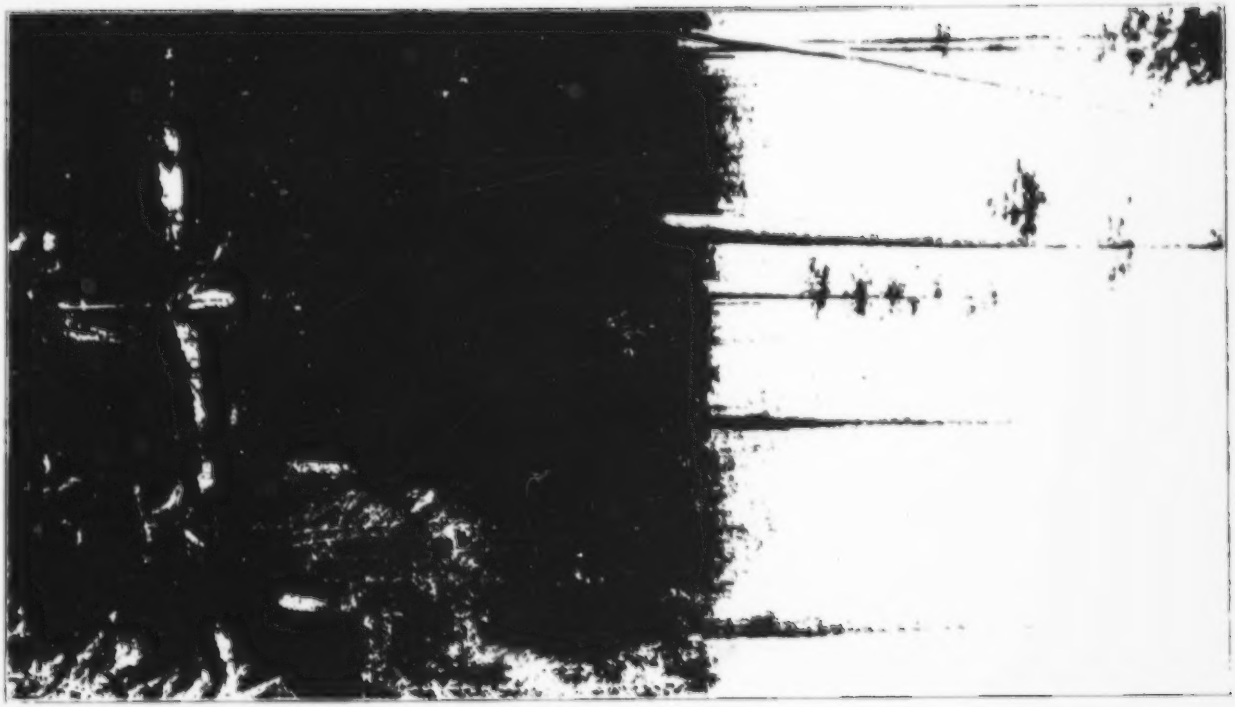
The recent creation of district offices throughout the Province and the payment of royalty direct to the Victoria office by operators in the interior and in the northern country will make a serious addition to headquarter routine, and so also will the establishment of a thorough system of accounting for all expenditures. The needs of the field force engaged [illegible] in connection with numerous timber-

problems that must be solved at Victoria. Thus on both the status and the accounting side the work will be intensified. The value of this work plainly depends to a great extent on the promptness with which each item of it is dealt with and completed. Specialization is essential. Hence, just as the Timber Inspectors have been relieved of their hampering duties as accountants and collectors and have been left free to attend to their essential work protecting the Crown forests and supervising cutting operations therein, so also the status section of the Victoria office will be enabled to deal exclusively with its own work by the concentration of all routine money matters into a separate accounting office. With this separation it is hoped that the status matters of the morning's mail will be dealt with by the afternoon, except in special reserved cases, and so that money received is acknowledged by the immediate mailing of a receipt. Automatic safeguards in procedure will prevent incorrect action by the accounting branch when any impediment exists from the point of view of the management or status offices.

CO-OPERATION.

With sufficient clerical help to cope with the large amount of detail involved, a record office can do a great deal to increase the efficiency of the field force of a forest service, especially in a country such as British Columbia, where the tenure of timber often involves a number of more or less complicated questions. The issue of a timber-mark is an illustration in point. This might be treated as a simple matter involving nothing but the registration of any mark with which an operator might wish to brand his logs, and the clerical work would be but slight. On the other hand, the applicant might be required to furnish the exact description of the timber upon which the mark was to be used; the office might then make copies of the official plans of the Survey Branch, showing not only the land on which the timber stands, but also all surrounding lands; the exact tenure under which all these lands are held might then be ascertained from the registers; a mark which indicated at a glance the class of timber the applicant was entitled to cut might then be allotted to him; and a summary of the facts, accompanied by coloured sketches, could be supplied to the Timber Inspectors of the district in question, so as to equip them with all the information that the records can yield concerning the revenue payable to the Crown from the logging operation covered by the allotted mark. Some timber is subject to royalty, some is not; some is exportable, other is not; and areas of each class are frequently intermixed to an extent that makes strict field supervision necessary to prevent timber subject to royalty from being cut and branded incorrectly when adjoining timber free from royalty is being logged, and to avoid consequent loss of public revenue. Similar troubles may occur through the mixing of the non-exportable class of timber with the exportable; or of the timber on which $1 per thousand feet is payble with that subject only to a royalty of 50 cents. When, therefore, a record office supplies the Inspectors—on each occasion when it registers a timber-mark—with a clear-cut mental picture of all the circumstances that may affect the amount of revenue to be drawn by the Crown from the logging operation covered by that mark, it does a great deal to increase the efficiency of these Inspectors. Moreover, subsequent requests to the Victoria office for necessary information, postal delays, and unnecessary correspondence are avoided.

The contrast between the two methods of dealing with a timber-mark record has been discussed in detail merely as one illustration of the way in which a live office organization may co-operate with the field force to the great benefit of administrative efficiency and the public revenue. Many other examples could be given of useful improvements already being carried out in the Records Office. For instance, the Lands and Survey Branches of the Department will henceforth be notified immediately whenever any timber licence, lease, or permit expires, so that the maps and registers may no longer be encumbered with dead material of this nature. District officers will be supplied with full information concerning the survey and standing of licences, the status of leases, etc., and as soon as possible a directory of Crown grants previous to 1906 and of pre-emption records in the more important logging districts will be compiled and copies furnished to the fieldmen concerned. Considerable arrears of work in connection with a necessary revision of the timber-mark registers are

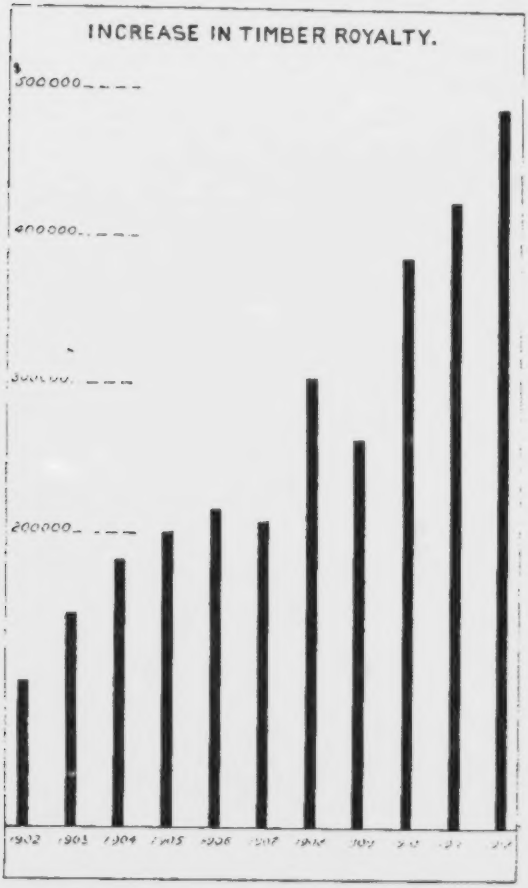


purchased will be watched by an effective system of property accountability. The royalty receipts and the scale returns will be accounted for in an effective manner, statements showing all arrears being made once a month. Incidentally, the place of origin of every boom of logs that is exported will be noted carefully. With the provision of sufficient clerical assistance and the disappearance of arrears of work, the time will soon come when all receipts for payments that are in order will be issued within twenty-four hours.

FOREST REVENUE.

(1.) SPECIAL LICENCES.

At the beginning of 1909 there were in existence 15,109 special licences to cut timber on Crown land, for each of which the Government was receiving, on an average, about $130 per annum. Though some of these have been cut over and abandoned, a number of others have been eliminated when exact survey of the ground has replaced the vague description of the original staker, and this is, without doubt, the chief reason for the decrease in the number of special licences that has occurred since 1908. A return showing licence surveys has just been completed by the Survey Branch. It would appear that nearly 700 were gazetted in the first nine months of the present year, and that 4,888 in all have been surveyed to date. The following decrease has occurred:—



Year.	Licences allowed to lapse.
1909	232
1910	253
1911	312
1912 (9 months)	110
Total	907

Since 1908 the annual revenue from this source has thus decreased by about $118,000. It is reasonable to suppose that further decreases, due to survey, will take place, but it is encouraging to note that, although far more licences were surveyed in 1912 than in any previous year (20 per cent. of the surveys gazetted in the nine months being of this description), the number allowed to lapse was much smaller than before.

The actual amount of licence rentals dealt with during the year was derived as follows:—

East of the Cascades	$ 745,194
West " "	1,192,000

There are in existence 14,202 special licences, the normal revenue from which should be, approximately, $1,846,000. The actual amount shown in the statements below as received for

fact that owing to the provision of some extra help in November no less than 2,400 licence renewals were issued.

(2.) ROYALTY.

The cutting operations in British Columbia are still conducted on a far smaller scale than the annual forest-growth makes desirable, but their steady increase and the increasing vigilance of Government supervision is shown by the receipt of $488,701 in royalty and timber tax for the past year, a substantial increase over the previous year and the largest amount yet obtained by the Crown from this source of revenue. Making a comparison with previous periods of twelve months each, we find:—

Calendar Year.	Royalty and Tax received.	Increase.	Increase per Cent.
1900	$ 96,479	.....	.....
1901	95,389	$ - 1,090	- 1.1
1902	99,635	+ 4,246	+ 4.4
1903	143,049	+ 43,414	+43.6
1904	182,791	+ 39,742	+27.8
1905	198,325	+ 15,534	+ 8.5
1906	216,065	+ 17,740	+ 8.9
1907	208,468	- 7,597	- 3.5
1908	305,276	+ 96,808	+46.5
1909	265,038	- 40,238	-13.2
1910	389,582	+124,544	+47.0
1911	425,185	+ 35,603	- 9.1
1912	488,701	+ 63,516	+14.9

The increase in ten years has thus been nearly fivefold.

NOTE.—It should be mentioned that "timber tax" for 1912, included in the above, amounts to $29,599; some of which represents the tax of 1 cent per thousand on old Crown-grant timber manufactured in the Province, and some $1 per thousand on timber of this character exported.

(3.) LEASES.

The area under timber leases amounts to 621,512 acres, the rentals varying from 5 to 25 cents per acre. Pulp leases at 2 cents per acre rental comprise 354,399 acres, and leases for the stripping of hemlock-bark a further 32,252 acres, on which rental is 5 cents per acre.

Existing leases covering over 386,000 acres have the right of perpetual renewal.

(4.) HAND-LOGGERS.

The number of hand-loggers increased from 144 to 161. The revenue from this source amounted to $4,125.

(5.) TIMBER-MARKS.

A gratifying increase is taking place at the present time in the number of applications for marks, owing to the effort of the Inspectors to secure compliance with the law.

The branding of logs is an essential means for securing to the Crown its just revenue, and great care is being exercised in the registration of marks. One hundred and fifty-eight new marks were registered.

A large number of old marks do not comply with the present law, as the areas over which they are to be used are not specified in the registration. This important matter requires immediate attention and the amendment of the Act.

Provincial forests may be shown in its entirety, it is of interest to quote the following returns of Crown-grant timber lands:—

District.	Acreage.		Assessed Value.		Average Value per Acre.	
	1911.	1912.	1911.	1912.	1911.	1912.
Esquimalt (Victoria)	16,451	17,588	$ 214,250	$ 227,800	$13 02	$12 95
Cowichan	70,728	74,486	885,453	986,093	12 52	13 24
Alberni	44,734	43,705	531,689	581,352	11 89	13 30
Nanaimo	47,413	63,753	543,782	711,920	11 30	11 17
Comox	162,329	185,265	2,371,469	2,389,788	14 61	12 90
Rossland	20,745	18,886	93,615	95,115	4 51	5 04
Kettle River	5,322	5,521	15,960	16,560	3 00	3 00
Slocan	47,962	47,368	250,000	270,000	5 21	5 28
Kamloops	2,420	4,960	12,100	5,600	5 00	1 13
Vancouver	7,428	7,428	111,678	111,678	15 03	15 03
Nelson	167,250	177,434	697,164	669,351	4 17	3 77
Vernon	5,323	4,819	15,645	20,200	3 00	4 19
Golden	77,000	78,114	298,225	298,226	3 87	3 82
Revelstoke	49,625	48,597	559,311	555,359	11 27	11 43
Fort Steele	100,084	96,811	602,681	603,981	6 02	6 24
	824,814	874,715	$7,194,022	$7,523,023	$ 8 72	$ 8 60

Statement of Forest Revenue.

	1912 (12 Mos. to Dec. 1st).	1911.	Increase.	Percentage of Increase.
Licence rentals and perpetuity fees	$1,937,194*	$1,931,375*	$5,819	0.3
Royalty and tax	489,377	425,571	63,806	15.0
Lease rentals	79,262	75,700	3,562	4.7
Sealing fees	36,833	28,590	8,243	28.8
Penalties and trespass	25,651	18,625	7,026	37.7
Trust Deposit Account interest	19,237	14,644	4,593	31.4
Special licence transfer fees	11,440	12,864	-1,424	-11.0
Hand-logger licences	4,125	3,575	550	15.4
Total	$2,603,119	$2,510,944	$92,175	3.7
Taxation from Crown-grant timber lands	150,460	143,880	6,580	4.6
Total revenue from the forests	$2,753,579	$2,654,824	$98,755	3.7

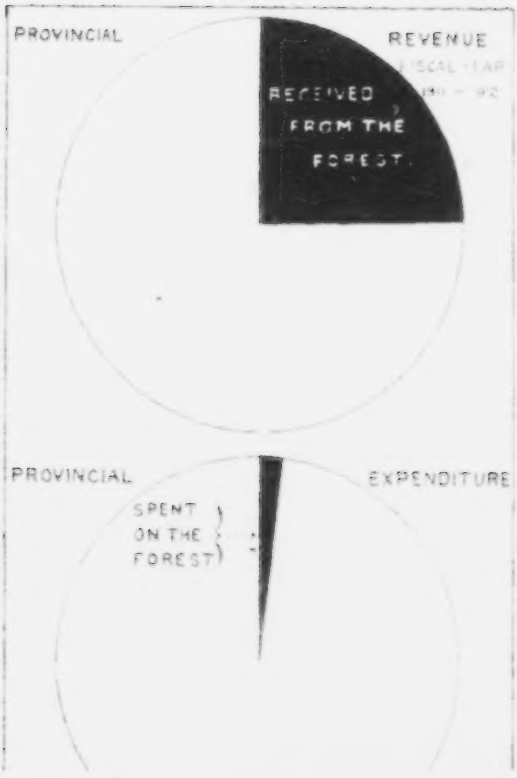
*The amounts shown represent only the totals dealt with in the accounting office during the twelve months. The rentals of existing special licences, as previously stated, amount to $1,846,000.

Expenditure (other than Forest Protection Fund).

The opening-up of many new lines of work, and the extension of the forest service to regions of the Province that have recently become of importance through the railway-construction now in progress, has naturally caused an increase in expenditure. The recruiting of a forestry staff for timber inspection, land classification, timber surveys, timber sales, and other work of an up-to-date forest service has increased the field staff by twenty-one members. Add to this, the upkeep of the temporary staff incidental to the earlier stages of organization;

Expenditure, Fiscal Year, April 1st, 1911, to March 31st, 1912.

	Eight Months, April 1st to November 30th.		Estimate, Four Months, Dec. 1st to March 31st.		Total.
	Salaries.	Expenses.	Salaries.	Expenses.	
Victoria Headquarters	$8,068	$2,402	$6,720	$1,060	$18,080
Field force	15,139*	17,773†	11,300	4,000	48,212
Vancouver office	5,809	1,993	3,150	320	11,282
Cranbrook, Nelson, Kamloops, Prince Rupert Inspectors	4,354	4,335	1,560	1,740	12,289
Official Scalers	14,510	1,868	7,200	1,200	24,858
Timber-inspection sundries		1,000		495	1,495
Coast launches	5,477	11,560	3,400	5,800	26,237
Instruments, supplies		4,191		700	4,891
	$53,957	$44,732	$33,930	$15,615	$147,184
Building of launches (estimated)					15,000
Government contribution to Forest Protection Fund					115,000
Payments of sundry Forest Protection accounts from 1911					707
					$277,947



The Forest Protection Fund.

Receipts.

For the support of this fund the Act requires 1 cent. per acre to be paid by all lessees and licensees of Crown timber lands and by all owners of lands which are classified as timber lands under the "Taxation Act." To the sum thus received the Government adds an equal amount from the public revenue.

Accordingly, a sum of $140,000 was included in the Estimates of 1912 and ear-marked for forest-protection. This sum is drawn upon for the purposes of the fund as collections are made from the other contributors.

Expenditure.

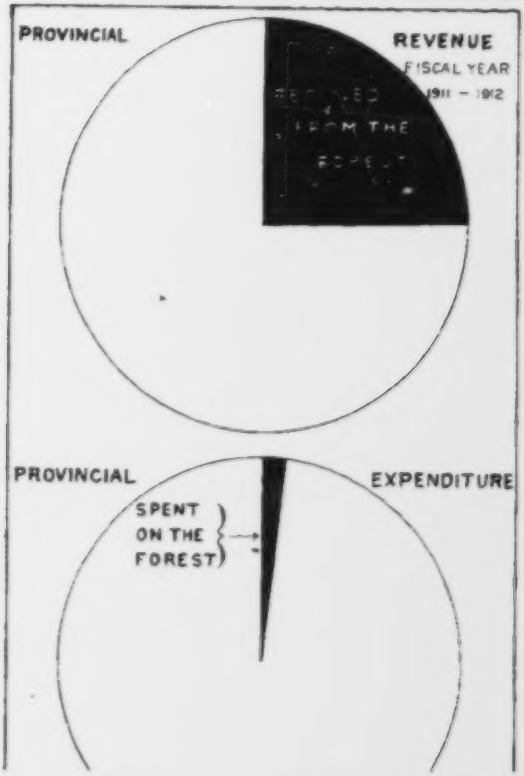
Weather conditions were the main but not the only reason for the small expenditure upon actual fire-fighting in 1912. A further reason one, too, that will become more forcible

*This includes wages of all packers, compass-men, cooks, and other temporary employees, an item that came (for example) to $2,000 in November.

†Of this amount, $1,365 was for launch-hire. A large amount in the aggregate was for the purchase of horses which are being

Expenditure, Fiscal Year, April 1st, 1911, to March 31st, 1912.

	Eight Months, April 1st to November 30th.		Estimate, Four Months, Dec. 1st to March 31st.		Total.
	Salaries.	Expenses.	Salaries.	Expenses.	
Victoria Headquarters	$8,668	$2,402	$6,590	$1,000	$18,660
Field force	15,139*	17,773†	11,300	4,000	48,212
Vancouver office	5,809	1,803	3,150	720	11,282
Cranbrook, Nelson, Kamloops, Prince Rupert Inspectors	4,354	4,335	1,900	1,700	12,289
Official Scalers	14,510	1,868	7,260	1,200	24,838
Timber-inspection sundries	....	1,000	....	495	1,495
Coast launches	5,477	11,560	3,400	5,800	26,237
Instruments, supplies	....	4,191	....	700	4,891
	$53,957	$44,732	$33,600	$15,615	$147,904
Building of launches (estimated)					15,000
Government contribution to Forest Protection Fund					115,036
Payments of sundry Forest Protection accounts from 1911					707
					$278,647



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*This includes wages of all packers, compass-men, cooks, and other temporary employees, an item that came (for example) to $2,000 in November.

†Of this amount, $1,385 was for launch-hire. A large amount in the aggregate was for the purchase of horses which are being

Typical Lodge-pole Pine and Spruce timber of Upper Fraser Valley.

Wide valley of valuable merchantable timber wiped out by fire. Upper Fraser River.

with every year—was the closer supervision that is being secured through improvements in organization. When poor judgment by an untried member of the temporary summer staff could result in the useless expenditure of thousands of dollars before the man's superior officers, perhaps hundreds of miles away, could hear of it, arrive on the scene of fire, and take over the control of the public purse-strings—in those days it was inevitable that heavy expenditures on individual fires should be made. When, as under the organization now being developed, the judgment of the man on the spot can be confirmed or corrected by the prompt supervision of his divisional officer in all fires where heavy expense may be feared, fire-fighting can be made both effective and comparatively cheap.

Forest Protection Expenditure by Districts, April 1st to October 31st, 1912.

Division.	No. of Wardens and Patrolmen	Fires with Expenses.	Fires without Expenses.	Cost of Fires.	Salary of Staff.	Expenses of Staff.	Launch Expenditure.	Total.
Victoria Headquarters	1	....	....	.....	$ 1,659.46	$ 649.98	.....	$ 2,309.44
Vancouver Island	24	28	32	$ 1,692.31	11,573.98	4,471.05	$ 361.00	18,098.34
Vancouver	26	22	13	1,633.76	14,163.50	5,360.00	.....	21,157.26
South coast launches	8	11	4	1,382.64	3,528.00	844.00	8,799.36	14,554.00
Vernon	13	9	6	748.24	5,271.50	2,569.17	.....	8,588.91
Kamloops	11	10	....	1,527.61	5,976.70	2,224.13	.....	9,728.44
Grand Forks	9	9	9	151.00	5,324.50	2,618.45	.....	8,093.95
Revelstoke	18	18	8	2,862.27	7,979.50	4,018.02	.....	14,859.79
Nelson	16	14	19	1,069.36	10,224.50	4,378.78	.....	15,672.64
Cranbrook	7	9	7	935.42	4,194.00	2,020.15	.....	7,149.57
Fernie	13	3	6	48.30	7,079.50	3,087.95	.....	10,215.75
Fort George	17	17	7	5,853.85	6,150.75	3,017.15	.....	15,021.75
Quesnel	7	3	....	572.13	3,281.50	1,984.38	.....	5,838.01
Lillooet	9	7	....	135.14	4,315.12	2,412.65	.....	6,862.91
Skeena	13	41	9	5,844.47	6,019.95	2,869.21	.....	14,733.63
Northern Coast	4	13	2	4,378.97	1,460.00	786.35	.....	6,625.32
Tete Jaune Cache	16	11	....	992.10	6,050.10	661.05	.....	7,703.25
	212	225	122	$29,827.57	$104,252.56	$43,972.47	$9,160.36	$187,212.96

Estimated Expenditure, Forest Protection Fund (Fiscal Year, April 1st, 1912, to March 31st, 1913).

	Fires.	Salaries of Staff.	Expense of Staff.	Total.
April 1st to October 31st, as shown above	$29,827	$104,252	$53,133	$187,212
Claims paid	666	.....	.....	666
November	.....	2,345	1,326	3,671
December to March (estimated)	.....	5,702	3,062	8,764
	$30,493	$112,299	$57,521	200,313
Building of launches (estimated)				13,000
Permanent improvements (estimated and depending on weather conditions)				30,000
		Total		$243,313

By arrangement with the Grand Trunk Pacific Railway Company, however, half the

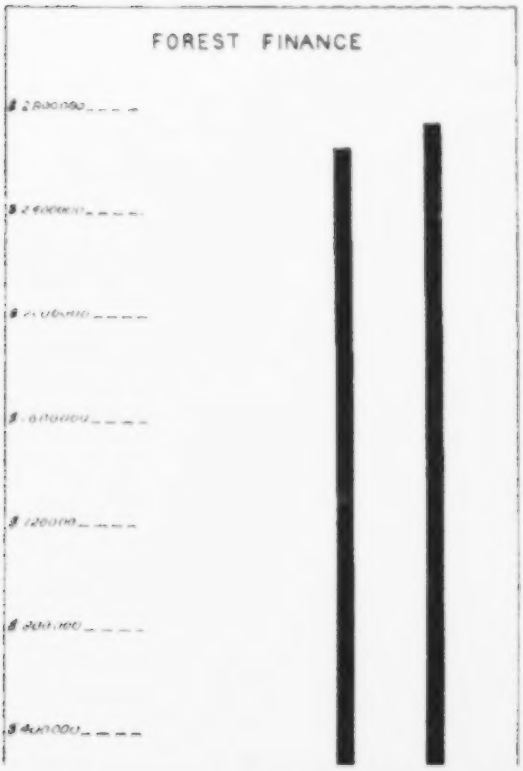
Taking these refunds, totalling $13,241, into consideration, the net expenditure from the Forest Protection Fund is reduced to $230,072, half of which, or the sum of $115,036, is chargeable to the Government.

Receipts, Forest Protection Fund.

Assessments to the fund are payable on—	Acres.
Crown-grant timber	874,715
Leaseholds	1,008,163
Special timber licences	9,089,280
E. & N. timber lands	200,000
C.P.R. tie reserves	543,497
Total	11,715,655

Total Fund.

At 1 cent. per acre on the foregoing areas there is therefore due:—	
From lessees, licensees, etc.	$117,157
From the Government	117,157
Total	$234,314



The estimate of expenditure made above shows that $4,242 may remain to the credit of the fund at the end of the fiscal year if the weather conditions permit of the carrying-out in full of the field-telephone and trail-construction programme.

Collections.

The amount due from the Government has been deducted from the vote of $140,000 on account included in the estimate for 1912, leaving $22,843, which sum (after deduction of $707 on account of sundry payments due from 1911) is reduced to $22,136, still on deposit to the credit of the Government. The actual collections to December 1st from lessees, licensees, etc., amount to $69,046, leaving $48,111 still to be collected during the remainder of the fiscal year ending March 31st next. The bulk of this is due from licensees, and will be collected automatically when the licences in question come up for renewal.

SUMMARY OF FOREST FINANCE.

The income from forest sources is the mainstay of the Provincial Treasury. It is true that, owing to the heavy receipts from land-sales during the last two or three years the forest

receives comes from a forest source. Moreover, the expansion of the lumbering industry has increased the Crown's annual royalty on timber cut fivefold in the last ten years. The inevitable progress of this industry, combined with the increased supervision that a larger forest service can give, will continue in this way to enlarge the forest revenue year after year, while the natural decrease in land-sales, the making of numerous timber-sales, and the effective protection of timber lands from fire should see Provincial finance based to an increasing extent on a great assured income from the woods. Recent years show the following results :—

Forest Revenue.

Fiscal year, 1910	$2,448,150
Calendar year, 1911	2,654,824
" 1912 (12 months to December 1st)	2,753,579

To collect this revenue, to protect the interests of the Crown in forest property, to conduct the necessary investigations upon whose results future policy must be based, and to safeguard the natural resources of the Province from the hazard of fire—for all these vitally important purposes the following expenditure by the Government has been made :—

Fiscal Year.	Departmental.	Forest Protection	Total.	Forest Revenue in Corresponding Calendar Year, per Cent.
Expenditure, 1910-11	$ 65,822*	$219,493†	$285,315	....
" 1911-12	60,071‡	144,590	204,661	7.7
" 1912-13	162,904§	115,743	278,647	10.1
1912-13, amount voted	160,404	140,000	300,404	....
Estimated expenditure	162,904	115,743	278,647	....
Credit balance			$21,757	

* April 1st to March 31st.
† Including expenses of this period paid subsequently.
‡ Including travelling expenses of officers.
§ Includes $15,000 for construction of launches.

The Government's expenditure on the forests of the Province is thus *one-tenth* of the revenue derived from them. Taking the total Provincial expenditure for all purposes in the year ending March 31st, 1912, we see that *one dollar in every fifty* expended was devoted to the forests; while, looking at the revenue returns, we see that *one dollar in every four* was received from this source.

The Forestry Commission report points out that Ontario as far back as 1908 was spending 9 per cent. of her forest revenue *upon fire-prevention alone.*

TIMBER INSPECTION.

The duties of the Timber Inspectors and Supervisors of Scalers in the past has been to collect royalties, supervise scaling, and prevent trespass and illegal export.

The timber-inspection staff has consisted of the Provincial Timber Inspector, with his office and clerical assistance at Vancouver; four Assistant Timber Inspectors—one at Vancouver, one at Nelson, one at Kaslo, and one at Kamloops. These assistants were concerned chiefly with the collection of royalty and had little time for inspection of operations in the woods.

The work of the Vancouver office required three Government launches. The "Allanbee," stationed at Mayne Island, patrolled the boundary to prevent the illicit export of logs. [illegible] Vancouver north to Seymour Inlet to examine hand-

growth of the Coast lumber industry from a cut of 475,000,000 feet in 1909 to 777,000,000 feet has created a need for much closer inspection and a larger staff. A field force is urgently needed which can handle promptly the vastly increased Government timber business.

Again, men are now needed for inspection in the new country which is being opened up by the G.T.P. Railway and the C.N. Railway. Sawmills will soon be building, and applications to purchase timber are already being received.

ORIENTAL LABOUR.

All timber licences have been issued with a clause prohibiting the use of Oriental labour in connection with the cutting of timber. All licensees, sixteen in number, who have been found during the past year to be employing such labour have been notified that the terms of their licences must be obeyed, and obedience has been vigorously enforced.

LOG-MARKING.

In 1890 the Legislature decided that every person who floated timber should put a personal mark on his logs. There were very few operations in those days, and doubtless the Department of that time felt that the personal marks of loggers were sufficient to enable it to tell which logs should pay royalty and which not.

The staking of over 8,500 licences in the Coast districts in 1906-7 and the great increase in the number of logging camps and hand-loggers made it much more difficult for two or three officials to know where every boom of logs towed to Vancouver, the Fraser River, or the American ports came from; and the situation was made more complicated by the laws which prohibited the export of four classes of Coast timber, while permitting the export of a fifth class at $1 a thousand, and a sixth class at 50 cents a thousand.

In consequence of this immense increase in the responsibilities of the Inspectors, the law was amended in 1910. Operators were no longer compelled to have mere personal marks to show who had cut the logs; they were to be compelled to have marks which would show what land the logs had been cut from.

The 1910 amendment was very necessary. Investigation showed that many operators did not mark their timber at all, or even register a mark. In the second place, many persons who registered marks did not say what timber they wanted the marks for. The 1910 law required every log to be marked with a special mark to show what Crown grant, lease, or licence it came from, and, since only thus could royalty timber be distinguished from non-royalty timber or non-exportable from exportable, the emphatic penalties of seizure and a fine of $500 were provided by the Act.

With the considerable increase in the staff engaged in the inspection of logging operations on the Coast that will be made as soon as the launches now under construction are put in commission, the complete enforcement of log-marking will be possible. Thus, the place of origin of each boom of logs can be traced without difficulty, the royalty or tax to be collected from the owner will be known with certainty, and the question as to whether the boom is or is not exportable will be settled beyond doubt. Log-marking on the Coast is the prime essential for the collection of revenue and the enforcement of the export provisions of the "Forest Act."

EXPORT OF TIMBER.

The export of manufactured timber for the past year has been as follows:—

Exported at $1 per M—	Feet B.M.
Cedar	33,608,990
Spruce	1,249,489
Pine	367,261
	35,225,740

Young Yellow Pine on logged-over land, Kootenay Valley, which is endangered by presence of slash left after logging.

Second-growth Poplar which has come up after fire destroyed the merchantable coniferous forest.

Only two classes of logs are exportable: (1) From lands Crown-granted prior to April, 1887, upon payment of a tax varying from $1 up, as provided in section 58 of the "Forest Act"; (2) from lands Crown-granted between 1887 and 1906, which only pay the usual royalty whether exported or not. No other timber is exportable unless manufactured, except ties and poles, which may be exported under an Order in Council. The large percentage of cedar that is exportable is due to the fact that cedar logs are much higher in price across the line than in the local market at Victoria and Vancouver; this is especially so for low-grade cedar, for which there is scarcely any market. Low-grade cedar which is hard to sell here for $5 to $6 per thousand readily brings from $9 to $10 across the line. Thus it is seen that there is a big profit in exporting cedar, and for this reason a close patrol must be kept to prevent the export of non-exportable cedar.

SCALING.

Scaling in the Province falls into two well-defined classes, owing to very different conditions and methods of logging and manufacture on the Coast lying west of the Cascades, and in the Interior lying to the east of them.

COAST DISTRICT.

The rapid increase in the scale returns is shown by the following:—

	Feet B.M.
1906	175,534,872
1907	413,649,077
1908	407,142,679
1909	475,855,570
1910	640,786,091
1911	559,212,225
1912	780,021,878

These figures do not include timber upon which 1 cent tax only is levied.

SCALE RETURNS FOR THE INTERIOR DISTRICT.

	Feet B.M.
1911	296,836,042
1912	325,371,873

TRESPASS.

The aggregate of the fines and penalties imposed during the year for timber trespass was $16,299.65

TIMBER SALES.

The present stand of merchantable timber in the Province is estimated roughly at 300,000,000,000 board feet. This estimate will apparently increase as a result of the forest surveys now being conducted by the Branch, and, of course, through the increase in stumpage values, which will make merchantable timber that is not merchantable now.

Until more accurate data are obtained, the amount of timber which can be cut annually without endangering the forests of the Province is estimated at 6,500,000,000 feet, board measure. This is a rough approximation based upon the information and figures obtainable, and is conservative.

The policy should therefore be to encourage lumbering in British Columbia, whose total annual profit is now less than one-fifth of the actual growth of the forests each year. Special attention should be given to secure the early cutting of the overmature stands of timber and those damaged by fire.

The Government timber-sale policy is to increase the annual cut, as business conditions permit, without sacrificing stumpage value, up to the point when the annual growth is

particularly in the Coast forests, by clear cutting followed by slash-burning. In other cases, particularly in the interior, enough trees must be left to shed seed, and slash disposed of by piling and burning when necessary.

The forest surveys now being conducted will yield prompt and definite information regarding the location, extent and value of those bodies of merchantable timber which the Department should sell in the immediate future. Information from prospective purchasers regarding other bodies of timber will be used as a basis for prompt examinations looking to timber-sales.

The procedure in timber-sales will involve a cruise by the Government, and the fixing of the price to be paid and of the methods of cutting to be followed by the purchaser. A reasonable deposit will be required as an evidence of good faith, but every effort consistent with the welfare of the forest will be made to facilitate his logging operations.

The timber-sale policy of the Department has already resulted in the applications and the new timber business shown in the following table. The sales now being advertised and shown in this table will yield a return of approximately $176,000 to the Government.

TIMBER SALES ADVERTISED FOR TENDER.

Locality and District.	Acres.	Feet B.M.	Poles.	By. Ties.	Upset Price.	Annual Rental.	Royalty.	Net Returns per Ac.
Adams Lake, Kamloops	970	1,720,800	340	4,485	$1,000 00	$174 30	$ 817 95	$ 2 25
" "	283	519,800	110	1,200	320 00	50 85	239 80	2 32
" "	193	343,400	....	2,230	240 00	34 65	171 70	2 44
			....	....	(5,100 00)	98 60	2,550 00	19 10
					$1 per M.			
Point Grey, near N.W.	405	5,100,000			225 00	16 40	225 00	6 22
Redonda Is., "	75	450,000	....	....	300 00	61 25	900 00	5 98
Pender Hbr., "	280	1,600,000	....	....	800 00	37 20	1,650 00	19 63
Deep Bay, "	170	3,300,000	....	....	1,650 00	17 50	1,050 00	44 59
Gordon Pasha Lakes, near N. W.	80	2,100,000	....	....	2,500 00			
					Poles, 1c. a ft.			
Myrtle Pt., near N.W	1,428	45,300,000	4,000	...	$1.50 per M.	312 35	23,150 00	48 15
					Poles, 1c. a ft.			
Near Creston, G. I., Kootenay	1,467	12,127,800	16,120	93,080	$2 per M.	263 35	8,807 50	29 98
" "	220	2,520,000	4,670	44,890	ditto	67 50	2,335 35	38 37
" "	479	6,440,000	3,500	10,000	"	98 10	3,685 02	28 29
" "	440	4,160,000	450	....	"	79 00	2,132 00	24 37
Myrtle Pt., near N.W	128	1,600,000	....	....	1,900 00	25 50	800 00	19 23
	6,718	87,232,100	29,300	156,485	.....	$1,304 55	$45,415 92	....

FOREST PRODUCTS.

In no other Province in Canada does the forest produce annually so large a proportion of the public wealth as in British Columbia; and a rapid and steady increase may be expected from this vast resource. The annual growth of the forests of British Columbia will yield a cut at least five times as large as it is at present.

It is of great importance that the Forest Branch should make every effort to stimulate the natural and proper increase in all industries dependent upon the forest until the annual cut equals the annual timber-growth, and to secure the most profitable use of the forest products in the Province. The Forest Branch co-operates effectively in this work with lumber associations and with individual manufacturers; and it can also render material assistance in the directions outlined below.

Arrangements have been made to co-operate with the Forestry Branch of the Dominion Government in collecting and publishing each year reliable statistics showing in full detail the character and value of the yearly output of different classes of forest products. These statistics will not only be valuable to both Governments, but also to all persons interested in timber industries or timber holdings in British Columbia; and they will also draw general attention to the progress and the opportunities in these Provincial industries.

The present large export trade of British Columbia consists almost exclusively of lumber, lath, shingles, poles, and ties, while a large import trade consists of manufactured articles made wholly or partly of wood. The Province would benefit greatly by the establishing of

Slash left after logging on the Coast is constant source of forest fires.

The Forest Branch will study the existing wood-using industries of the Province and the opportunities for extending them. Information thus obtained will attract attention to this class of manufactures, and point the way to the development of the industry as rapidly as markets and labour conditions warrant.

The problem of closer and more profitable utilization of timber now wasted is most important. Not more than 40 per cent. of the timber standing on the land logged over each year is being used. Part of this is full waste and cannot be helped. Some individual loggers and manufacturers have gone far in reducing waste, and credit is due to those companies which have succeeded in reducing waste far below the average in the Province. In attempting to reduce the waste of timber in logging and manufacture, a method of practical conservation which is second in importance to fire-protection only, loggers and manufacturers are struggling against most unfair market conditions. Complete conservation of our timber resources and complete utilization of our timber can be effected only where it is possible to market low-grade material. The Prairie West affords the only natural market for low grades, and since our timber is shut out of the American Prairies by the tariff, the only market left for this class of material is the Canadian Prairies.

The following table shows for 1911 and 1912 the American lumber and shingles shipped into the markets upon which British Columbia lumber manufacturers depend :—

IMPORTATIONS FROM U.S.A. TO MANITOBA, SASKATCHEWAN, ALBERTA, AND BRITISH COLUMBIA.

Lumber, Laths, and Shingles, from January 1st to November 1st, 1911, and January 1st to November 1st, 1912.

	1912.			1911.			Per cent. Increase 1912 over 1911
	Feet B.M.	Value.	Average per M.	Feet B.M.	Value	Average per M.	
Planks, boards, etc., dressed one side, not dutiable	207,762,000	$2,377,262	$11.44	190,768,000	$2,324,994	$12.13	9
Sawn boards, etc., dutiable	49,291,000	645,670	11.07	31,348,000	390,866	12.11	53
	257,053,000	$3,022,932		222,116,000	$2,715,860		
	Pieces.			Pieces.			
Laths	63,720,000	134,624	2.11	58,220,000	134,795	2.31	9
Shingles	82,887,000	152,402	1.84	17,206,000	32,781	1.90	381
Total	.....	$3,309,958	.....	.....	$2,883,436	.....	14

There are several points about this table which are worthy of notice.

The total quantity of the lumber imported into British Columbia's field of trade in the first ten months of 1912 was 257,053,000 feet, an amount equal to about one-fifth of the annual cut of the Province. The average price of this lumber was from $11.07 to $11.44 per thousand feet, which shows that the market could have used the low-grade lumber from British Columbia mills. As the direct result of this importation from the United States, approximately 250,000,000 board feet of timber was left lying in the woods in British Columbia, or went into the incinerators.

The importation of American lumber was 15.8 per cent. greater in 1912 than in 1911. The imports of American cedar in particular have increased most rapidly, being 381 per cent. greater in 1912 than in 1910. This choking of the natural market with foreign low-grade material is seriously impeding the development of forest conservation in British Columbia. The American manufacturer pays no duty on his sawmill machinery. He produces lumber

HAZELTON.
SALMON
RIVER

MAP

SHEWING

FOREST AREAS SURVEYED.

1912

This is not the case in British Columbia. Both in the interior and on the Coast conservative logging would produce a large amount of low-grade material. But the trouble is that the British Columbia millman cannot sell his low-grade material; the British Columbia logger cannot sell his low-grade logs, therefore the low-grade lumber goes into the burner or is used for fuel, and the low-grade logs stay in the woods.

It may be possible to devise profitable uses for the sawmill waste produced in the larger milling centres. It has been shown for example, in the United States that Kraft pulp and paper, a high-class, very strong wrapping-paper, may be profitably manufactured from the edgings, trimmings, and other refuse of Douglas fir. The establishment of such an industry on the British Columbia coast would depend wholly on the market; the raw material could be cheaply secured in abundance at such points as Vancouver or New Westminster.

Studies have been begun by the Forest Branch to determine the practicability of manufacturing wood-alcohol, turpentine, and resin from the sawmill waste of Douglas fir and yellow or bull pine. A small plant has been working for some time in Vancouver producing turpentine, tar-oil, and pitch. A process has lately been developed in Florida by which turpentine, resin, and chemical paper-pulp may be manufactured very profitably from southern yellow-pine. Since Douglas fir and the yellow-pine of British Columbia are resinous woods, the Forest Branch has sent samples to the Florida plant in order that they may be tested.

A syndicate of progressive Vancouver lumbermen and business-men has under consideration a project for using the sawmill waste of that city as fuel for a central heating and power plant.

The pulp industry, now started in British Columbia, will in the future do much to promote cleaner logging and closer utilization of timber. Eastern Canada is always spoken of as best fitted for a permanent pulp industry. The advantages which Eastern Canada possesses over British Columbia are artificial rather than natural. These—namely, cheap transportation and access to centres of population which provide labour, markets, and capital—will eventually come to British Columbia along with improved facilities for manufacture. The forests of British Columbia contain much larger quantities of pulp-wood than any Eastern Province, necessary water-powers exist in conjunction with the pulp-wood areas. There are large areas of spruce and jack-pine in the Province which compare favourably, both in quantity of pulp-wood per acre, extent and location, with the pulp-wood limits of Eastern Canada, but which have as yet been considered unmerchantable.

There are five pulp-mills in British Columbia with a combined daily capacity of about 300 tons. Only two are at present working on a steady basis.

There is an opportunity at the present moment for the promotion of the wood-block paving industry. The reputation of wood-block paving has suffered in British Columbia because in the past the wood has been imperfectly treated with preservative and imperfectly laid. Wood-block pavement thoroughly prepared and carefully laid on solid foundations gives as satisfactory service as asphalt. Increased use of wood-block pavement affords an opportunity to extend the much-needed creosoting industry, and opens a large profitable market for common fir lumber, since paving-blocks (made from 4 by 8 common lumber), consume about 1,000,000 feet of lumber for each mile of road-pavement.

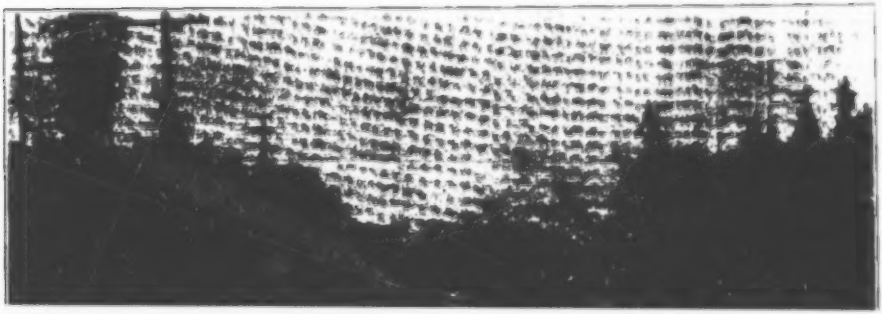
Lumber manufacturers of British Columbia who attempt to gain entry into Eastern Canada and foreign markets find that they meet, in addition to prejudice resulting from the comparatively unknown qualities of British Columbia timbers, the competition of foreign timbers the strength and quality of which are advertised by the widely circulated results of Government tests. It is important that assistance should be rendered the lumber industry of this Province in securing entry into such markets. If Eastern Canadian builders, decorators, and other purchasers were aware of the finishing qualities of high-grade lumber from this Province, a profitable market could be developed.

A small permanent exhibit of interior finish at a trade centre, such as Toronto, would be a most effective agency in promoting amongst the right class of purchasers a knowledge of the higher qualities of those British Columbia woods which are now known only in their coarser forms.

Great assistance could be rendered in the marketing of British Columbia timbers abroad

Rollway, Yellow Pine Logs, Kootenay Valley.

Dangerous slash left along electric power transmission right-of-way.



to have careful tests made at a well-equipped engineering laboratory, to secure accurate data on the strength of our structural woods. As there is no testing laboratory in this Province, arrangements have been made to have the necessary tests carried on at McGill University in co-operation with the Dominion Forestry Branch.

There are minor forest industries which it may be possible to develop. The bark of the Western hemlock now being logged on this Coast in fairly large quantities is almost twice as rich in tannin as the Eastern hemlock. Most of the bark is wasted now; an effort should be made to develop a market for it. Another example is the bark of the Cascara sagrada, (a species of buckthorn growing on the Coast and islands), for which there is a large and active market. One Eastern firm wishes to secure 800 tons annually.

FOREST SURVEYS.

In every country in which the practice of forestry by the Government has been established successfully, it has been found that a comprehensive knowledge of the quality, condition, and extent of the forest resources in the country concerned is the prime requisite of their efficient administration.

The Forest Branch has already made a good beginning upon the forest surveys needed as a basis for its work. During the past season forest surveys were inaugurated on the Okanagan Lake Watershed the Nicola Plateau, the North Thompson Watershed, the Salmon River Valley, and the Upper Columbia.

The purpose of these surveys is twofold. The most urgent need for them is to supply information needed as a basis for efficient work in the creation of forest reserves, the construction of permanent improvements, and the distribution of the field force. While satisfying these needs, these forest surveys will yield at the same time detailed information regarding the stand of commercial timber in the different regions, its size and quality, and its availability for successful lumbering operations, which will be of great practical value to lumbermen and other forest-users, as well as in the development of a progressive public timber-sale policy.

Naturally the completion of these forest surveys will take several years. As rapidly as they are completed the results will appear in the published reports of the Forest Branch, illustrated with the necessary maps of the regions. In the case of the more remote forest regions, it will be some time before the necessary work is done as a basis for its publication. But it is hoped well within a year to issue one or more of the forest survey reports of the Forest Branch.

I have the honour to be,

Sir,

Your obedient servant,

H. R. MACMILLAN,

Chief Forester.

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1913.